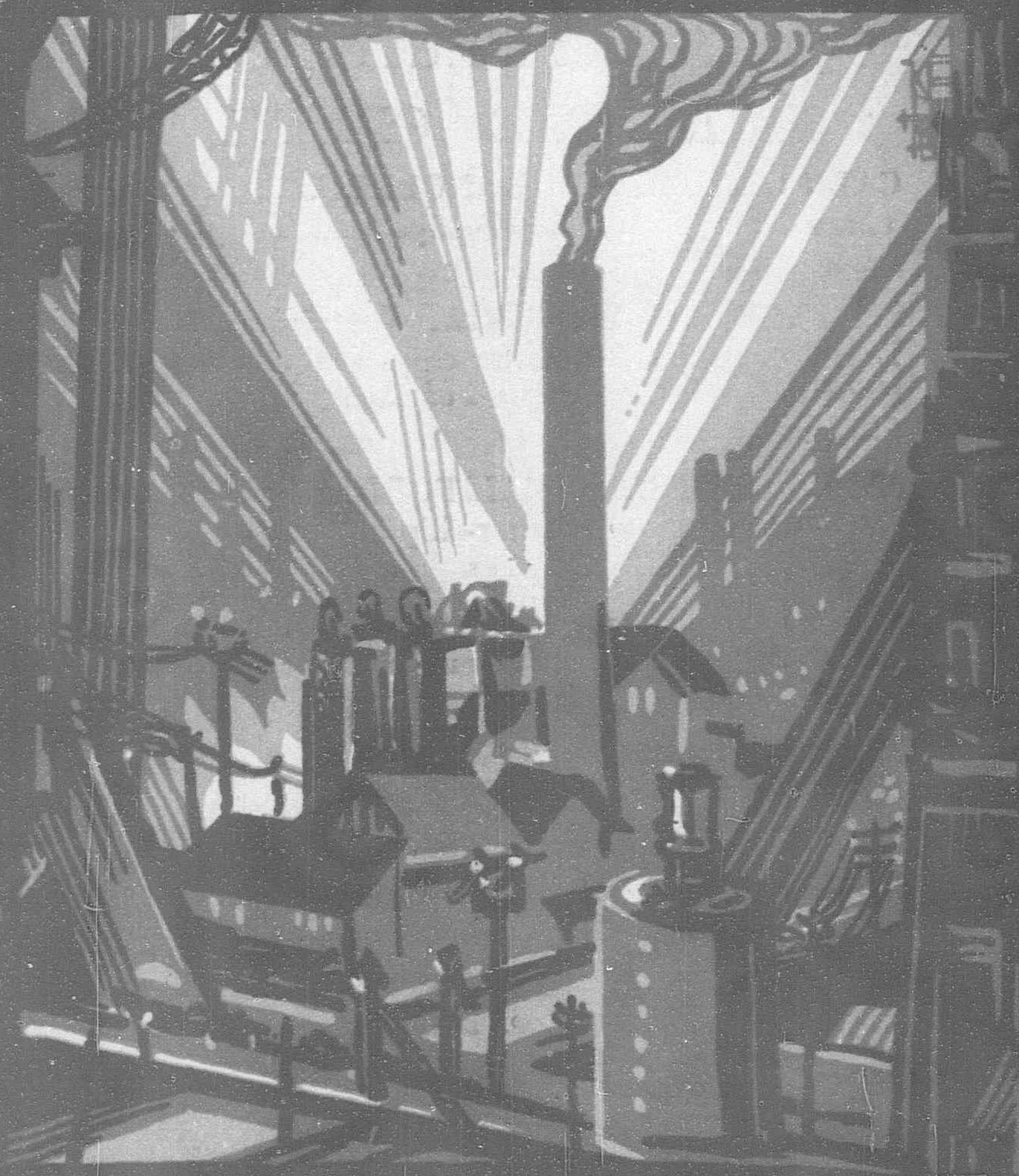


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MANCHURIA AND THE MONROE DOCTRINE
CLAUDE OF THE LEAGUE COVENANT
MATSUOKA DISCUSSES MANCHUKUO
AMERICAN STRATEGY IN MANCHURIA

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The Manchurian Incident, and the Monroe Doctrine Clause of the League Covenant

K. S. INUI, HOGAKUHAKUSHI (LL.D.)

ARTICLE 21 of the Covenant of the League of Nations says :
"Nothing in this Covenant shall be deemed to effect the validity of international engagements such as treaties of arbitrations or regional understandings like the Monroe Doctrine, for securing the maintenance of peace."

I.—It is a well-known fact that this Article was inserted in the Covenant, as an inducement to the American entrance into the League of Nations. On January 22, 1917, President Wilson, in explaining Article 10 of the Covenant, incidentally stated that "territorial integrity" and "political independence" embodied there, owe their birth to his revolutionized idea of the Monroe Doctrine. "I am proposing, as it were," he said, "that the nations should with one accord adopt the doctrine of President Monroe, as the doctrine of the world."

In justifying his course, the President again said on September 27, 1918, "We still read Washington's immortal warning against entangling alliances with full comprehension and an answerable purpose. . . . But only special and limited alliances entangle and we. . . . hope for a general alliance which will avoid entanglements." This in a way is an explanation of Article 10 of the Covenant, but it also indicates that his understanding of the Monroe Doctrine is not merely Pan-Americanism, but Pan-"worldism" in which America concedes a joint responsibility of the whole world in maintaining peace.

The subsequent events, refusal of America to join the League, however, testify to the effect that she was not quite ready to accept such a broad interpretation as expressed by the Father of the League of Nations. The Senate reservation, Number 6, championed by Senator Lodge, in November 1919, states clearly the position of the United States as regards the Monroe Doctrine. It reads as follows :

"Any question which in the judgment depends upon, or relates to. . . the Monroe Doctrine : said doctrine is to be interpreted by the United States alone and is hereby declared to be wholly outside of the jurisdiction of said League of Nations and entirely unaffected by any provision of the peace treaty." Hence, it is to be admitted that the United States was not willing to release her position of the sole interpreter of the meaning of the Monroe Doctrine. On this point, Oppenheim observes "Article 21 of the Covenant of the League of Nations does not make the doctrine a rule of international law. This stipulation was adopted to avoid interference by the League, with existing or future arbitration treaties, with policies which find expression in the Monroe Doctrine, and with existing or future defensive alliances, guarantee treaties and the like."

From this line of reasoning, the exact significance of the Monroe Doctrine as inserted in Article 21, is no more ascertainable than before. Even if the League might have been led temporarily to give heed to the Wilsonian explanation, we are still compelled to look to that American august body as the last and sole authority. It was this undoubtedly that prompted Mexico, when she joined it on September 11, 1931, to make a reservation to the effect that she had never recognized the so-called "regional understandings" as embodied in Article 21 of the Covenant of

the League. For it is inconceivable that she should have any objection to the Wilsonian interpretation of the famous American pronouncement.

II.—It was under these peculiar circumstances that the League of Nations found it advisable to give certain "international engagements such as treaties of arbitrations or regional understandings" the same footing as the Monroe Doctrine. Now the question arises, what, then, are the other treaties of arbitration or regional understandings like the Monroe Doctrine for securing the maintenance of peace ?

To those who are familiar with the proceedings of the organization of the League of Nations, it is a well-known fact that among the treaties referred to in Article 21, were included the Ishii-Lansing agreement, the Anglo-Japanese Alliance and the British agreements which are specially concerned with the Red Sea and the Gulf of Persia. We are aware that when Article 21 was proposed, Dr. Wellington Koo, the Chinese delegate at Versailles, asked if "regional understandings" included the Ishii-Lansing agreement. Lord Robert Cecil, who was then, the chairman of the committee, replied in the affirmative, adding to it the British interests in the Gulf of Persia, to which we have already referred. From the foregoing circumstances it must also be said that the interpretation of these regional understandings such as the Ishii-Lansing agreement and British reservations, are to be made only by the parties concerned.

This construction seems to be in accord with the inclusion in the Covenant of the American Doctrine which is neither a treaty of arbitration, a regional understanding, nor a provision in international law and which is proclaimed and maintained unilaterally by the United States and the United States alone. In other words, the provision of Article 21 of the Covenant of the League takes into consideration the existence of peculiar situations in maintaining peace and order in certain parts of the world through a policy which finds its authority in the power, indulgence and goodwill of one nation and which is possible of different expressions, as the exigencies of the situation arise.

III.—The fact that the Ishii-Lansing Agreement came to an end on April 14, 1923, is a matter of historical record. However, question arises, have the conditions or substance for which the agreement was created, disappeared ? In his "Diplomatic Memoir," Viscount Ishii, who is one of the joint authors of the agreement, makes an interesting observation. He says that the Agreement is the declaration of the following three points :

- (1) The special interests of Japan in China.
- (2) The guarantee of the territorial integrity of China.
- (3) Commercial and industrial open doors with equal opportunities in China.

He questions whether the termination of the Agreement meant also the discontinuance of those three points. The second and third of the declarations owe their origin to the Hay Doctrine of 1899. Since then these points have been made the guiding principles of the American policies *vis-à-vis* China. These principles are not only embodied in Japan's agreements with the United

States but also with Great Britain, France, Russia and others, and cannot, therefore, be unilaterally renounced. After all, the extinction of the agreement means, the termination of the first point.

The special interest of Japan in China, is something that owes its origin to the natural geographical position. This interest was not derived from the United States or any-one else. Viscount Ishii, here, characterized the work of Secretary Lansing and himself as that of a photographer. The Ishii-Lansing Agreement photograph might have been destroyed, but the substance still remains. He reiterates that Japan's special interests in China, Manchuria in particular, need no recognition by any other power. It was advisable to know that it was legally recognized by another power. Such was the case of the Ishii-Lansing Agreement. Whether recognized or not, the fact remains unchanged. Japan has special interests in Manchuria in whatever name they may be designated. This fact is as real to the Japanese as the Monroe Doctrine is to the people of the United States.

IV.—In other words, President Wilson's idealistic interpretation left a shadow in Article 21 of the Covenant of the League of Nations. But the substance is still reserved in the safe keeping of the American Government and people from whom it derives its force and authority. Japan's special interests in Manchuria are not only due to propinquity, but due also to the historical and traditional background which finds concrete expressions in treaties and understandings, even if their sweeping recognition in a documentary form might have been destroyed. For the Japanese interests they have never ceased to exist; and as in the case of the Monroe Doctrine, they are to be interpreted primarily by the directly interested party or parties immediately concerned.

V.—Coming back to the League of Nations; in the course of its evolution it has been brought face to face with two currents of thought. On the one hand, the idealism of the universality of the League and on the other Continentalism as typified by the Pan-Europeanism of Count Coudenhove, proposing to bring into existence, the United States of Europe. It was actuated by

the motive to be free from American domination, real or unreal, and become the joint masters of Europe. This was brought within the range of actual League politics and was finally championed by no less renowned a statesman than Aristide Briand who proposed to create the system within the frame-work of the League of Nations. It has been and still is, almost hopeless to reconcile the League's ideals of Universality and the Monroe Doctrine or its proposed counterpart for Europe. This led to an increasingly serious discussion in this part of the world and brought into bold relief the two conceptions already above referred to.

When the Pact of Paris was signed, the idealistic statesmen of America and Europe as well as of the Far East, once more tried to jump into the universality of world peace organs and instruments without any reference to the time-honored continentalism in their own respective countries. However, when the Treaty of Arbitration between France and America, the corollary to the Pact of Paris, was signed to settle international disputes by peaceful methods in accordance with its Article II, the United States placed her cards on the table and unmistakably excluded the Monroe Doctrine from the application of the Pact, as did France for the cases for fulfilling the obligations of the League Covenant; and both nations clearly excluded the measures for self-defence.

It is also to be noted, according to the now generally accepted rules of international law which find ready acceptance by American authorities, including former Secretary of State Kellogg himself, that each nation is to be the sole judge as to the nature and extent of such measures.

For after all the first rule of law governing disputes, whether domestic or international, is to try to settle them between the disputants themselves. Has the League of Nations sufficiently developed to be capable now of ignoring, or should it now ignore, these stern fundamental realities to adopt the Wilsonian idealism of universality—which found disappointing support in the land of its birth—in the present Sino-Japanese imbroglio, the cause of which is the least known in history and which is most peculiar and characteristic to this part of the world?

American Strategy in Manchuria

By STEPHANE LAUZANNE, Editor-in-Chief of "Le Matin"

IF clearness of sight is one of the virtues of strategy, then the American strategy concerning Manchuria totally lacks virtue. There could indeed not be a strategy more confused and confusing.

At the very start of the troubles, the United States undoubtedly sided with Japan. I was in Washington at the end of October, 1931, during the Laval visit, and could have had no more agreeable surprise than to hear Under-Secretary Castle's appreciation as regards Japan's action in Manchuria.

"If Japan is in Manchuria," he said to me when I called at the State Department, "it is owing to treaty rights conceding a police zone to her. It may be that Japan exceeded her rights in encroaching on the limits of the zone, but there can be no discussions about the fact that she was provoked by China to do so. If we want Japan to go back to her zone, we have also to bear pressure upon China to cease her bloody and endless provocations. The two things go hand in hand."

This was an altogether reasonable view of the situation; but, alas! it proved to be but a passing view. In fact, if afterwards we were able to witness the unceasing effort of the United States to get Japan to withdraw her troops, we never heard of any effort of the United States to get China to cease her provocations. The two things never went hand in hand in the various orations and diplomatic interventions of the American State Department.

Different To-day

To-day the strategy of Washington is somewhat different. It tends to show that the extension of the Japanese occupation has settled nothing and that Japan will have to widen her military

operations—perhaps even to push her troops right into the heart of China.

"Irregular Chinese bands," states the Paris edition of the *Herald Tribune*, "encouraged, financed, and supplied by China proper, are as active in what was formerly the relatively peaceful Japanese sphere of influence in South Manchuria as in the wilderness of the North and West. They not only keep a large and expensive Japanese army of occupation everlastingly hopping hither and yon, but by the blight that they impose upon industry and commerce they continue to advertise to the desperately depressed Japanese nation that the day when the State of Manchukuo will begin to become a paying enterprise is still a long way off. It is suggested that, because of these considerations, the growing activities of the guerillas will give Japan an excuse for an invasion of Jehol, where some of the troubles are incubated, and then of the Tientsin and Peiping area, whence it is supposed to be directed."

The tendency of such articles and information is obvious. They try to create the impression that the task of the Japanese army will never end; that the occupation of Tientsin and Peiping will have to be followed by further occupations; that each extension of the area of occupation will give greater scope for guerilla activity behind the Japanese lines, will mean greater dissipation of Japan's military strength, and will elicit from the Chinese in all parts of the world more protests, more propaganda, and more anti-Japanese agitation. There might even be the hope, in certain American circles, that the story of Napoleon's campaign in Russia will repeat itself and that the Japanese forces, drawn further and further into the Chinese vastness, will melt and weaken. And there is also the hope that Japan may lose patience, resort to war, and sink in a sea of international complications.

Depends on Japan

It will, of course, depend upon Japan to destroy all those hopes and thwart all those calculations. The friends of Japan know what both her tenacity and her wisdom are: they have no doubt that neither China nor any other country can do anything against them.

As to Secretary Stimson's statement that "America will not recognize a situation resulting from a violation of international agreements," it caused many Frenchmen to smile. First, it would have to be proved that, in exercising her right of self-defence, Japan has violated any international agreement. Then, is it sure that Japan cannot overlook America's recognition of the changes that have occurred in Manchuria? There is to-day in Europe a case which is rather similar to that one—the case of Bessarabia. This province has been annexed by Rumania. And Russia did exactly what America proposes to do: she refused to recognize

the annexation and declared that, in her eyes, it was non-existent. However, it exists nevertheless: and Rumania has occupied Bessarabia for 12 years, collects the taxes, insures the law, regulates justice, nominates the officials the same as in the rest of the monarchy. A precarious situation, say some people. But in the world there are many precarious situations, to which their possessors adapt themselves easily.

"In the way of furniture," states an old French law, "possession is equal to security." In the way of territories, this is often the same. The new State of Manchukuo may very well organize itself, fortify itself, and become prosperous without America's official recognition.

The best strategy is the one which faces facts, which admits loyally that a country has the right to repair or prevent injuries to its rights, and does not try to uphold banditry and movements against law and order.

Matsuoka Discusses Manchukuo

Chief Japanese Delegate to Meeting at Geneva Does Not Believe Necessity Will Arise for Japan to Withdraw from the League

(The following article was written by Yosuke Matsuoka shortly before his departure from Japan for Europe for the "Chuo Koron" and is reprinted from the "Japan Advertiser" for which originally it was translated.)

By YOSUKE MATSUOKA

WHERE does the inevitability of the foundation of Manchukuo lie?

I am not the man to think of matters in a scholastic or round-about way, and the word "inevitability" is too grand. My way of thinking is simpler and straightforward. Disintegration is now going on in the whole of China, and the Manchurian issue, in a way, may be linked with a whole chain of events actual and potential. China, in its history of 5,000 years, has witnessed many unions in the course of which it has proved that no one can check it if integration comes to pass; neither can anyone stop disintegration in China when the trend of things points that way, and things begin to move. To the same degree it is impossible, too, for anyone to keep China united as a nation when it begins to disintegrate.

The force working at such a stage of China's history is beyond anyone's power to check or direct into other channels. Since my student days I have studied the Chinese situation, but I must confess that I have always been bewildered as to whether China at a given time was on the eve of unification or dissolution. At one time I was positive that China was on the sure road to construction, but at another time I felt that she could not escape final destruction. In between times I have been entirely at a loss as to her ultimate fate. The question is, of course, a very complex one and any conclusive opinion would be a bold forecast, yet we have to answer it one way or another if we must decide on our China policy.

Placed in such a dilemma, I have made a serious study of Chinese affairs, and I can say that most people have made the mistake of attempting to base their view of Japan's relations with China on the very affairs which crop up from day to day, month after month, or year after year, without viewing the situation as a whole; they have neglected to review the entire situation from time to time apart from the questions demanding immediate solution.

Want United China

We of the Orient, however, especially the Japanese, are desirous of seeing a united China, reconstructed and renovated, and in consequence we are apt to be too optimistic about China's future, being dragged along, so to speak, by the wish of seeing China united as a stable nation with a good government.

China's situation for the past few years, however, cannot but be indicative of the collapse to which she is hastening. This is evident from recent phenomena in China. At this juncture, when China is heading straightway toward the fatal catastrophe, no

one can stop her or direct her otherwise. It is not strange, therefore, that there has been a secessionist movement in Manchuria materializing in the foundation of the new State of Manchukuo. The thing was inevitable.

Now is Manchuria, viewed in the light of history, Chinese territory?

In the strict sense of the word, Manchuria cannot be said to have been an integral part of China. Though recently large numbers of Chinese arrived in Manchuria, it only became Chinese territory in the sense of the word when the republic was founded. Before that time Manchuria was the private estate of the Ching dynasty. Historically, therefore, it would be wrong to talk about the independence of Manchuria as a phenomenon in the process of the disintegration of China; at least it is indisputable that there was a wide difference of significance between the sovereignty of China Proper and that of Manchuria. Even at the time when China exercised the greatest influence over Manchuria, it would be correct to say that she merely exercised suzerain rights over it.

Japan is losing trade with South China amounting to Y.700,000,000, through the Manchurian dispute. The suspension of Japan's trade with South China since the outbreak of last autumn has hit Japan very hard, but this, it may be said, might have happened even without the Manchurian outbreak, although of course to a lesser degree. Without the Manchurian issue doing the harm, Japan's trade with China would have been hit severely by the depression, the floods in the Yangtze valley, communist disturbances in the hinterland and the disruption of peace over large areas of China. No doubt a half of the decrease may be attributed to the boycott against Japanese merchandise due to the Manchurian issue, yet I am not overly distressed about it. I am afraid of developments which may lead Sino-Japanese relations from bad to worse, and ultimately to war, if efforts are not made to prevent the animosity from intensifying, but I am not pessimistic about the harm done to Japanese trade with China. Trade mainly follows economic laws, and any manipulated check is not likely to continue for long. As long as the Japanese make cheaper goods to overcome foreign competition, the Chinese cannot but buy them in spite of political manipulations to the contrary. This may be proved by the statistics for the past 20 years; the volume of trade decreases when a boycott is at its height, but it rises again as soon as there is an indication of decline in the intensity of boycott. On an average the volume of trade does not show any marked decrease. We have heard some foreign observers state that Japan can never sell to Chinese at the point of bayonets. This is an observation which totally ignores the

truth about Japan's China trade; the Japanese have never tried to do anything of the sort in the long past; Japanese manufacturers and merchants have ever been intent upon meeting Chinese requirements more cheaply than their competitors. If the Japanese are beaten in this respect, Japanese merchandise would entirely disappear from the China markets, even if there were no boycott. Otherwise the Japanese will be able to sell their merchandise to the Chinese in spite of boycotts.

Economic Bloc Project

Much discussion has been going on regarding the possible economic relations between Japan and Manchukuo. The question is not a new one but we have given much thought to it in the past. And it is also a problem which, I am convinced, is not easily disposed of by mere argument. Industries in Japan, for that matter, are not under unified control, and there is no doubt that those in Manchuria are not ready for unified control. How can one talk of controlling two systems of industry in two countries each of which needs control? It would be possible, of course, to readjust each in the face of the requirements of the respective country, and I might say that in the past, control was made by a natural process, the surplus in one overflowing to make up the insufficiency in the other. Foreign trade must always balance if it is to go on indefinitely. In my opinion trade between Japan and Manchuria should be based solely on the natural requirements of each nation. It is not difficult to grasp a comparison of the trade statistics of the two countries. From a survey of the list of Japan's exports, and imports, we see that Japan does not export any considerable amount of agricultural products except some specific products, while she imports most of her industrial materials from abroad. In a word, Japan must found her industrial system on a solid basis and secure foreign markets for her industrial products; Japan's requirements and her foreign economic demands and supplies are well shown in the balance sheet of foreign trade. From Manchuria and Mongolia she may secure what she needs for the establishment of her industrial national policy, at least most of her requirements can be met by supplies from there. There is no need for Japan always to look for a supply from America or Europe. If she could get the same materials from Manchuria or Mongolia cheaper than she could elsewhere, she would do well to rely on the supply from Manchuria or Mongolia.

From statistics of the foreign trade of Manchuria and Mongolia, we can clearly see that they chiefly export agricultural products, followed in the order of importance by timber and other natural materials, of which Japan receives mostly minerals of which coal is of paramount importance, as well as agricultural products and other materials for her industries. Imports into Manchuria and Mongolia are chiefly manufactured goods, more than half of which are from Japan. These factors are self-explanatory; we can see from these simple facts, what we have to sell and buy.

Recently we have heard a good deal about coal. At particular times, it may be necessary to manipulate the import or export of a certain product, but it is doubtful in this particular case if the import of two million tons of coal from Manchuria was the sole factor that deprived the mining operatives in Japan of their means of livelihood. It would be reasonable, however, that they demand some restriction on the ground that they are inevitably made to feel the pressure of Manchurian products under certain economic conditions such as these prevailing nowadays. Viewed from a higher plane, however, it may be said that the import of Manchurian coal in the past has had a healthy influence on the home industry because of the need for competition.

Altogether these matters cannot be dealt with by argument alone. The total stoppage of all imports of coal would seem the best means of protecting the miners at home, but such a thing is not practical nor healthy. The matter should be viewed in a broader light.

When deliberating on possible methods of unified control of economy between Japan and Manchuria, it needs no emphasis that the well-being of Japanese at home must be considered first, but at the same time it would never do to contemplate anything extreme, otherwise it would be at variance with the object with which we have set out to deal with Manchuria and Mongolia; we would have lost sight of the true objective with which we have started on this gigantic business. We must aim, from beginning to

end, at an equal share in the establishment of economic solidarity between Manchuria, Mongolia and Japan. We should ultimately aim at a complete economic bloc with these regions. When Manchuria has been placed in the economic sphere of Japan, the Japanese then should conceive of some satisfactory means of solution of the diverse questions arising in Manchuria, based on a progressive and steady economic policy. The Japanese are a race of men strong and competent enough to do this. In a restricted sense Manchuria has already been under the economic control of Japanese even in the past; it is now coming into more intimate relations economically, and I should think that the Japanese are competent enough to cope with the situation.

Extending over a pretty long period Manchuria will be an agricultural area; she will remain for some long time a source of supply of materials for various industries, while Japan now faces the urgency of founding herself on a solid basis as an industrial country. With such supplementary factors at the basis of their mutual relationship, there is no possibility of the two countries competing for markets. It would not be very difficult to set down a program calculated to control the economic activities of either country to their mutual benefit.

Heilungkiang Province is poor in its natural resources, but would it be possible for Manchukuo to manage its economic independence without it? This is a question which people are asking. In my opinion it would be wrong to conclude that Heilungkiang Province is poor in natural resources as compared with Kirin or Mukden Province. On the contrary I suspect that Heilungkiang Province has an enormous future in respect of natural resources. It may be conceded that an independent economic bloc might be maintained with only Kirin and Mukden Provinces, but why should we tax our brains with this particular issue now? Both Heilungkiang and Jehol Provinces have exhaustible natural resources, awaiting exploitation by the brave and the daring.

Finances of Manchukuo

Now a word about the financing of Manchukuo. This is nothing problematical. No one, for instance, would think of comparing Manchuria with Korea, as Korea has a revenue of Y. 500,000,000. Manchukuo expects an income of 90,000,000 yuan during the current fiscal year, and bases its expenditure on an estimated income of 80,000,000 yuan. I believe it can tide over the situation with that much. The Chinese, as everyone knows, are an industrial race, who, as individuals or as a State, have made much of the philosophy of "regulating expenditure by measuring the revenue." Manchukuo is not seriously troubled by such social questions as unemployment yet, although of course such questions exist, they have not become political issues needing immediate solution. The situation there has not reached the stage at which these questions are immediate problems.

The population in Manchuria is about 30,000,000 as compared with 20,000,000 in Korea, and it tends to increase rapidly. Most of the inhabitants are of the Han race, noted for their industry, perseverance and tenacity for life. The soil itself is incomparably richer than that of Korea. It is likely that at no distant date Manchukuo will come to have a large revenue as a State.

The natural resources of Manchuria and Mongolia have not been investigated with any thoroughness yet. Reports are available only for a small part of the whole due to personal danger and other difficulties that must be faced by those proposing to investigate the hinterland. Gold mines are discovered even to-day in Japan proper, where geological investigations might seem to have been exhausted. In view of this fact, it seems reasonable to expect there is a good chance for prospectors but there are dangers from bandit attacks and other perils in the vast area of Manchuria. There have already been discoveries of minerals in Manchuria which are unobtainable in Japan, such as magnestie. When peace and order prevail over the wilder tracts of land within the jurisdiction of the new State of Manchukuo, there is no doubt various rich mining resources will be discovered. It is only those who have seen only small parts of Manchuria who harbor pessimistic views on these matters. We have more perseverance and patience in the study of the natural resources as well as other conditions existing in Manchukuo. There is a common tendency among Japanese scholars to be over-critical of things which are first brought to their attention; even when they have to acknowledge the correctness of those who have brought them to their attention,

they depreciate things as if that were the sure and authoritative way of impressing others with their scholastic views. It would not do to be over-critical and deprecating when one has to deal with things relating to a new State such as Manchukuo which is burning with the desire to achieve things in the future. I would advise Japanese scholars and scientists to give a free rein to their creative and constructive imagination, freeing themselves from their hard-boiled, matter-of-fact way of thinking. It would be better for some of them to engage in such an enterprising study as the Shantung research made some time ago by the German scholar, Lichthonen. "Constructive imagination contributes more to the well being of humanity than critical reason," is a saying which may well be addressed to most Japanese scholars.

For the safety of the Japanese Empire it is absolutely necessary, both from the viewpoint of national defence and from economic necessity to help the new State of Manchukuo develop along a healthy line of progress. Sound development of the new State is essential for the maintenance of peace in the Far East, and it is quite possible that Japan will reach an understanding or agreement promising to help Manchukuo in its development as an independent State. This, however, does not mean that Japan would ever establish a protectorate over it.

Japan has recognized the new State as an independent State. The Japanese, as a matter of fact, would be glad to lend assistance, but it would not do for the Japanese to interfere in the internal affairs of Manchukuo. The Japanese should rather lead the Manchurian people in such a way that they themselves should be able to conduct their internal affairs. The ultimate objective of the Japanese is to see the establishment of a Manchurian State, which, while enjoying full integrity as an independent State, would identify itself with Japan by desire for the security of peace in the Far East, at the same time offering to co-operate with Japan to the mutual benefit.

The Extrality Issue

Now we come to such issues as the possible abolition of extraterritoriality or the so-called unequal treaties which must be faced shortly. My opinion about the abolition of extrality is that it should be abrogated on condition that jurisprudence, the system of justice and prisons are rectified progressively. The Japanese, of course, are expected to help the Manchukuo authorities in these matters, and it should be done as soon as possible. The quicker the better. The same may be said about the so-called unequal treaties.

About the question of recognition of Manchukuo and the Anti-War Treaty. In my opinion neither the Anti-War Treaty nor the Nine-Power Treaty have any direct bearing on the recognition of Manchukuo. The foundation of the new State is an established fact. Because of the intimate relations which Japan has with Manchuria, Japan can never assume an easy-going attitude in the matter as it is possible for other Powers to do. The question is incomparably more important to Japan than to any other nation; it is a vital question with Japan, while it is not so with the other Powers. It is in the interest of Japan as well as the peace of the Far East, that Japan should extend *de jure* recognition to the new State. The other Powers will have to recognize Manchukuo in one way or another ultimately. Japan's extension of recognition to the new State of Manchukuo, does not violate the international treaties mentioned above. Those intent upon directing criticism against Japan may say that Japanese helped in the independence movement, so some may go further and say that Japan instigated it and agitated. Such allegations, however, are very far from the truth as everyone well acquainted with real conditions in Manchuria or China knows. The new State of Manchukuo has not resulted from any outside manipulations. It was born of an innate need among the people. Even if some Japanese helped in the foundation of the new State, it would not do to confuse the fact that the new State exists. In extending *de jure* recognition to Manchukuo Japan merely took a formal time-honored international procedure. Would it be possible to say that it was against the Nine-Power Treaty or the Anti-War Pact to recognize a new State?

A word about Japan's diplomacy at Geneva. Some observers say that Japanese troops advanced to Tsitsihar and Chinchow shortly after Japan had given her word of honor that she would not occupy Chinchow. It looks as if Japan had eaten her words. The truth, however, is far from what observers of this sort may

have thought. Things moved too fast at that time in Manchuria, and besides it must be conceded that there was little understanding between the military authorities in Manchuria and the home government in those days. It may be said that the Cabinet Ministers themselves were not always of one opinion. Even within the military quarters, there was not the perfect unity between those in Tokyo and those far away in Manchuria which you may easily imagine to be possible at a time when things are moving rapidly. There is no doubt that the Foreign Office was of the opinion that Chinchow would not be occupied. You cannot conceive of Baron Shidehara telling lies about glaring facts. He is not the man to tell a lie. He was opposed to the occupation of Chinchow. He attempted to prevent Japanese troops advancing on Tsitsihar. The trouble with him was that his wishes and hope did not come to pass in reality. Things moved along in spite of him. It would be cruel to blame him for playing a game like Machiavelli.

As is inevitable in times of emergency, there were discordant voices even in the Cabinet Council, and there were cases in which the military command in Manchuria and the General Staff in Tokyo found little agreement. The conflicting information abroad, it may be said, justly reflected the discord existing in Japan at the time of the outbreak. It is natural that Japan was thought to be telling glaring lies, but the truth, as I have taken the trouble to explain, is that Japan never told a lie knowingly. In the moment of confusion Japan showed her naked figure abroad; that's all.

Establishment of Manchukuo

Some voice disbelief in the fact that the establishment of Manchukuo has been the aggregate will of the 30,000,000 population. In my turn I should like to ask them how many Communists they think there were when Lenin first rose against the old régime. It is claimed there were 100,000 or 200,000 at the time. To-day the number of Communists is about two or three million in a population of 150 millions. It is the same everywhere; the voice of the people, when analyzed is found to be that of a few leaders. One should not forget that all movements are started by a few intelligent persons.

As I stated at the beginning it may be said that the establishment of Manchukuo was part of the disintegration going on in China. Whatever force the Japanese might mobilize, they would never succeed in detaching a portion of territory from China, say Manchuria, if China herself was not undergoing disintegration. It is ridiculous to state that the Japanese separated Manchuria from China proper and established the new State by their own hands. Such a statement is a contradiction of the philosophic principle well founded in the history of the development of humanity.

I am not in a position to make a forecast about the possible conclusions which the Assembly of the League of Nations may reach in disposing of the Sino-Japanese dispute. Nor have I thought much about the possibility or advisability of Japan's withdrawal from the League of Nations. The truth is, I believe, that what the Japanese think about Manchuria and the relationship of the Japanese Government with the establishment of Manchukuo are quite right and as they ought to be. I am convinced that those who direct criticism at the Japanese or the Japanese Government are quite mistaken, and I feel it incumbent upon me to enlighten them in order to help them understand the truth of the affair.

When the Assembly of the League of Nations comes to deal with Manchuria, it is possible, I imagine, that there will be some heated argument, for all the world is a little excited and Japan herself more than the others. It is possible, too, that through force of circumstances arising from heated discussions, Japan may have to announce her withdrawal from the League. However, I think we need not trouble ourselves with this kind of possibility now. As far as I know, there is a likelihood that the European nations and America, in comparison to Japan, have the faculty of cooler thinking in the long run, especially the larger nations. It is quite possible that representatives of smaller nations, who have practically no serious interests in the Far East, are more apt to run to extremes in their arguments because they base them on an impractical idealistic standpoint totally ignoring specific factors in dealing with actual problems, while it is also possible that among the greater nations in Europe there may be some

which, through fear that similar cases might be brought about under their own jurisdiction, may advance arguments to suit themselves entirely ignoring the special factors of the situation. In my way of thinking, both are wrong; representatives of smaller nations can be convinced of the actual conditions which have led to the present situation in Manchuria only if they are made to realize how things really stand. The Japanese themselves at the same time should compose themselves, so to speak before attending the forthcoming session of the League Assembly. Standing on a mistaken premise it may be possible to attack Japan and the Japanese in the Manchurian entanglement, but if once those who criticize Japan and the Japanese are furnished with adequate knowledge regarding the point at issue, it would not be possible for them to continue to level criticism against Japanese action in Manchuria.

Relation With League

It goes without saying that the Japanese should always be prepared to sever connections with the League of Nations or any other international organ for that matter in case such machinery takes steps conflicting basically with the maintenance of peace in the Far East. It is not required of us now to be prepared for this in connection with Manchuria. It would be more fitting for us Japanese, I should think, to do our best to gain the understanding of the other nations than talk about withdrawal from the League. There is absolutely no reason to justify consideration of withdrawal at this juncture as far as Japan is concerned. In my opinion the Japanese should not deliberate on such a matter at this time, they should be more broad-minded.

Recently a foreigner asked me if Japan would secede from the League of Nations. I replied, "I have not thought about that. If the European and American nations do not understand the just stand of the Japanese, I should advise them to secede from the League themselves. Japan will stand by the League even if all the others have left it."

Japan is really called upon to offer knowledge and information about Manchuria as well as her attitude with regard to it. Some may ask why we should condescend to take the trouble to do so. My answer is why not explain the whole matter without condescending. Japan having taken what steps she has, she is by duty bound to offer information about the whole affair for the enlighten-

ment of others. The Japanese are ever conscious that they must contribute towards world peace. Since the formation of the League of Nations, Japan has stood by it most faithfully, intent upon contributing toward the perpetuation of world peace through it. The Japanese know that the biggest enemy of peace is misunderstanding and lack of adequate knowledge. As it is quite possible to contribute toward world peace eliminating or making efforts to eliminate such lack of adequate knowledge and misunderstanding about things, I think it is our moral duty to do so as our contribution for the promotion of the well-being of humanity. If the Japanese still pay attention to and have concern over world peace, and considering Japan still is a member of the League of Nations, I should think, we should attend the forthcoming session of the League of Nations Assembly with this moral background.

Agrees With Uchida

Count Uchida, Foreign Minister, at the last session of the Diet, declared that, if the worst comes to pass at the Assembly of the League in connection with Japan's recognition of Manchukuo, Japan would have her will even if her whole territory were burned up. But is there any such danger?

A speech by a Foreign Minister is partly intended for foreign nations and partly for home consumption. I think that Count Uchida made the above statement in order to remind the whole nation that they must be prepared for the worst. I should not catch him in his words, but should appreciate the spirit which underlies it. I fully concur with Count Uchida about the length to which the whole nation must ever be prepared to go in case of emergency.

Now we come to the possibility of Japanese recognition of Manchukuo meeting with an uncompromising opposition in the worst form. It would not help matters to answer such a question. I cannot imagine such a contingency, but I am called to answer "in case of extreme emergency" which is not very likely, I should think I ought to refrain from talking about it considering the position I am now in, for misunderstanding is possible in such a discussion and taken amiss either way. Viewed from another angle it may be said that the question is similar in nature to asking if I would pick heaven up if it fell down. My answer either way would not mean anything at all. The fact is that I do not think the heavens will fall upon us.

An Inquiry and a Reply

SEEKING opinions of a number of leading Americans on the question of Japan's withdrawal from the League of Nations should the League Inquiry Commission condemn Japan for her Manchurian policy, Dr. Sidney L. Gulick, Secretary of the Commission on International Justice and Goodwill, wrote to Ashley E. Holden, Secretary of the Japan Society, asking him for his views on this subject. Dr. Gulick also asked how a better understanding of American-Japanese relations might be promoted.

In his reply to Dr. Gulick, Mr. Holden, expressing his personal views, said in part as follows: "First, I should say emphatically that it certainly does not behoove anyone in the United States much less our Government to criticize Japan should she deem it advisable to withdraw from the League of Nations for any reason whatsoever. If the United States were a member of the League of Nations, then it might be quite another matter; but I cannot but wonder what Japan would think of Christian America should we find fault with the mote in Japan's eye and overlook the beam in our own."

In further reply to Dr. Gulick, Mr. Holden said: "If I interpret your viewpoint rightly, I take it that your Commission is opposed to the means which Japan has taken to settle her disputes in China. Here again do I feel that it is inconsistent for the United States to criticize Japan, unless we are willing to put on sackcloth and ashes and repent for our own similar misdeeds of the past. When the United States is willing to return Panama to Colombia, when we are willing to grant independence to the Philippines,

and retire from Nicaragua, then, and only then, can we justly criticize Japan's military program in Manchuria.

"The answer to the first part of your second question is found in that portion of your folder which reads: 'China lacks a responsible government, able to fulfill her international obligations... China cannot maintain law and order anywhere... When China sets her house in order, establishes a competent and responsible government, and puts an end to civil war and to war-lords, she may expect to recover complete sovereignty in Manchuria.' In my humble opinion, this program which you have outlined for China cannot be consummated in this generation. Indirectly, America is responsible for the Shanghai Incident. The lawless and riotous student mobs of China, for the most part, were educated in the United States. Their efforts to make a republic out of China brought about the present deplorable state of affairs.

"If Americans sincerely want to restore peace and stability in Asia, they will do well to cease criticizing Japan, and seek to establish a basis for mutual understanding and co-operation between Japan and the United States that permanent peace may be maintained around the Pacific. We should face realities and recognize Japan's destiny as the dominant nation in Asia, just as here in the Western hemisphere, the United States is the dominant power. We should also recognize that Japan is far better informed and better qualified to deal with China than are we. Furthermore,

(Continued on page 495)

C. S. Taylor Transferred

FRIENDS and associates of Mr. C. S. Taylor, Vice-President and General Manager of Shanghai Power Company, will be interested in the recent cabled advice that he is to remain in London as a representative of the companies associated with Electric Bond and Share Company.

Mr. Taylor's lifelong and intimate association with electric utilities particularly equip him for his broader duties and responsibilities in London. His immediate responsibilities will be the selection and supervision of the 22,500 kw. turbo set for the extension to Shanghai Power Company's "River-side" power station and the selection of employees for engagement by Shanghai Power Company.

Prior to coming to the East, Mr. Taylor was employed by the Watford Corporation Electricity Supply Company as Mains Engineer, and later held a position as Assistant Chief Engineer to the Hendon Electric Supply Company. In November, 1911, Mr. Taylor accepted the appointment of Deputy Engineer and Manager to the Hankow Light & Power Company, Hankow, China, and held that position until March, 1913. Mr. Taylor was then offered and accepted a position with the Shanghai Municipal Electricity Department as Substation Engineer.



Mr. C. S. Taylor

In 1914, Mr. Taylor was appointed Power and Substation Engineer. His promotion was rapid and uninterrupted from that time and in successive steps he advanced to Deputy Chief Engineer and General Manager under the late Mr. T. H. U. Aldridge. Upon the acquisition of the Shanghai Municipal Electricity Department by Shanghai Power Company, Mr. Taylor was elected Vice-President and appointed General Manager, positions which he now resigns to take up his duties in London.

At the commencement of Mr. Taylor's association with the predecessor organization of Shanghai Power Company in 1913, the kilowatt hour output of the plant was 21,888,230 units, which output has steadily increased and totalled 693,314,127 units in 1931.

While Mr. Taylor was eligible for retirement in 1934, it is now anticipated that his transfer to London, his consequent reunion with his family in the land of his birth, and his broader responsibilities may preserve and interest him in many more years of association with the profession which has been and remains his devoted and justifiable pride. Mr. Taylor's London address is: c/o Whitehall Securities Corporation, 53 Parliament Street, Westminster, S.W.1.

Roads in Kiangsi, China

Owing to disturbed conditions in Kiangsi during the past few years, road construction has not made rapid progress. The provincial bureau of reconstruction, however, has had well-laid plans for a provincial system. In June, 1930, the provincial government approved plans for the construction of about 1,000 miles of highway, at an estimated cost of \$10,000,000 (Chinese silver), to be raised by the issue of a provincial loan. In May, 1931, the commission of reconstruction petitioned the Ministry of Finance at Nanking for authority to float bonds.

On October 24, 1931, construction was started on Kiangsi-Hunan provincial highway, to connect Nanchang, the provincial capital of Kiangsi, with Changsha, the capital of Hunan Province. The project is to give relief to flood sufferers in the immediate district. The plans of the provincial reconstruction department call for local districts to contribute one-half the cost of construction for the particular district. The Kiangsi International Famine Relief Committee has appropriated \$35,000 (Chinese silver) so that work may begin immediately in the Hsinchion district, which was recently largely inundated.

The Kiangsi-Chekiang road, approximately 140 miles long, connecting Kiangsi with Chekiang Province, on which construction was started in 1930, will eventually link up Nanchang with Yushan through several important cities.

A new 25 mile road between Yushan and Kwangsin, built by the Government from locally subscribed funds, and another route of 25 miles from Yushan south to Kwangfeng, were opened to Traffic on December 1, 1931.

On the Kiangsi-Fukien route, requested by citizens before the provincial highway bureau had designed plans for its construction, it is reported that 80 per cent of the earthwork in the local district has been completed.

The 150 mile Kiangsi-Anhwei road, to connect Nanchang with Anhwei Province, will pass through such important districts as Kingtenchen, the center of China's porcelain industry, where approximately \$6,000,000 worth of chinaware is produced annually when the district is not harassed by banditry. Some earthwork on this route in the Fuliang district has been completed, and about 50 per cent of the work in Tuchang is finished.

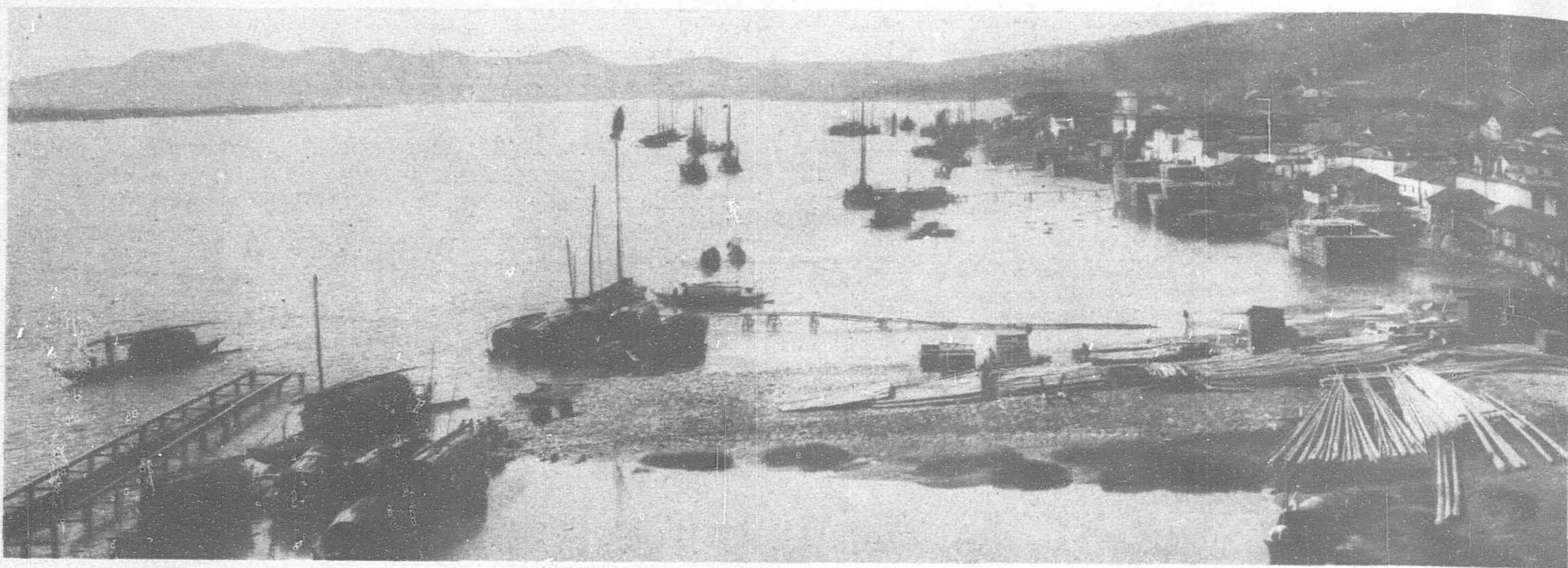
The Kiangsi route of 170 miles, passing through Kao-an, Shangkao, Wantsai and Pingsiang near the Hunan-Kiangsi border, traverses an extensive coalmining district. Construction on the first section of this route leading southwest from Nanchang was begun October 24, 1931, as a flood-relief measure.

An Inquiry and a Reply

(Continued from page 494)

if those of us who so ardently favor world peace and ultimate disarmament would only recognize that, by criticizing the military policy of Japan, we are playing directly into the hands of the militarists of the United States; and particularly are we providing that most destructive moulder of public opinion, William Randolph Hearst, with fuel to feed the flames of prejudice and suspicion.

"Advocating economic boycotts, and charging Japan with intentions of annexing Manchuria, in the face of her specific statements that Manchuria will not be annexed, is, I maintain, not conducive to an atmosphere of understanding and goodwill between the United States and Japan. Let us be realists, let us face the facts, and, above all, let us honestly strive to understand and respect Japan in the light of our own past history. Upon this basis only can there be established that amity between us which is essential to the future peace and well-being of the world."



View of Chien Tang River from New Power Plant Building—Looking upstream, showing Stone Paved Spur Dyke

Power for the Development of Industry and Agriculture in the Hangchow District

Modern Electrical Plant Operating in Capital of Chekiang Province Has Many Special Features

By *HOLLIS H. ARNOLD, Consulting Engineer*

ABOUT three years ago Mr. Chang Ching-kiang—Chairman of the National Construction Commission and concurrently Governor of the Province of Chekiang—arranged a loan with a Syndicate of Shanghai bankers to carry out a programme of industrial development in this Province. As the initial step in this programme instructions were given to Mr. Pai Ming-hsing—Director of the Electricity Bureau—to build a power plant with city and rural distribution lines of sufficient capacity to meet the immediate requirements for electric power for local industries and for irrigation and drainage of agricultural land.

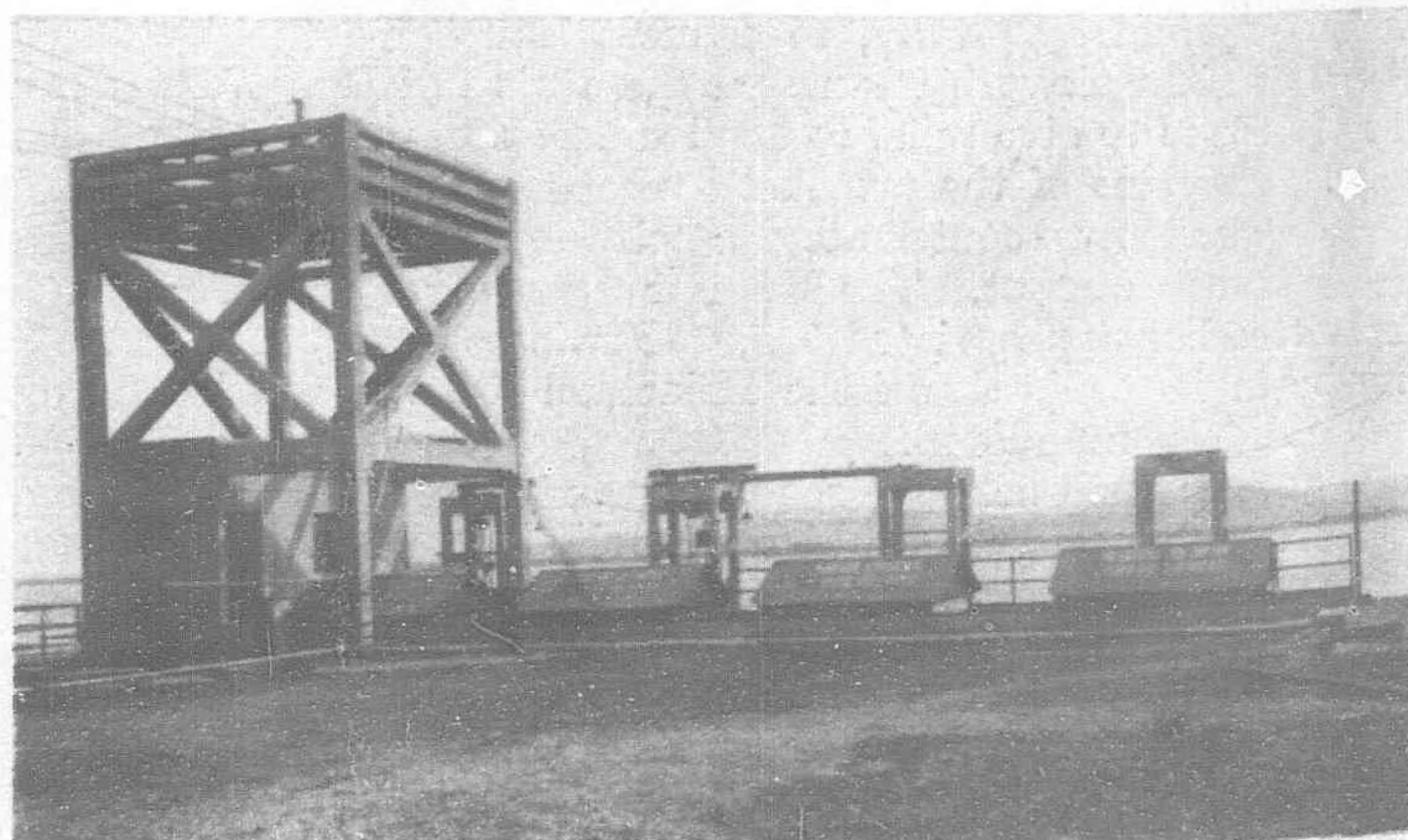
Within a 50 mile radius in the vicinity of Hangchow there is an area of more than two million acres of highly developed agricultural land below the level of high water in the Chien Tang river and at approximately the same level as highest high water in the Yangtze river. Portions of this land having facilities for irrigation and drainage produce three crops of cereals and vegetables per year. The market value of agricultural land in this district is M.\$100 to M.\$300 per mow, corresponding to a value, per acre, of G.\$133 to

G.\$400. Rice growing land with ample water for irrigation but without danger of surplus flood water has the highest value. The variation in value is largely due to water conditions. The period of maximum rainfall occurring during the rice growing months in low lying areas necessitates drainage pumping to avoid flooding of rice land and loss of crops. Men and draught animals and small engines are now used extensively for driving pumps. It appears that large motor driven pumps of high efficiency may be economically utilized for drainage to increase the extent of areas suitable for rice growing.

The largest industry in Hangchow is silk manufacture. Mills are now in operation for cotton spinning and weaving and paper making. On the south and east sides of the city—adjacent to the railway, canals and river—there are extensive areas of comparatively cheap land suitable for manufacturing plants. The freight rate from Hangchow to Shanghai, for fifth class goods, is approximately M.\$1 per short ton, which is less than the average cost of trucking from wharves to warehouses in Shanghai.



No. 2.—View of the Chien Tang River from Power Plant Building, looking downstream, showing Concrete Bund and Stone Paved Protection Dyke



No. 3.—View of Chien Tang River looking south from Plant Building, showing Pump House Roof and Superstructures for No. 1 Overhead Line Tower and for Water Intake Gates and Screens

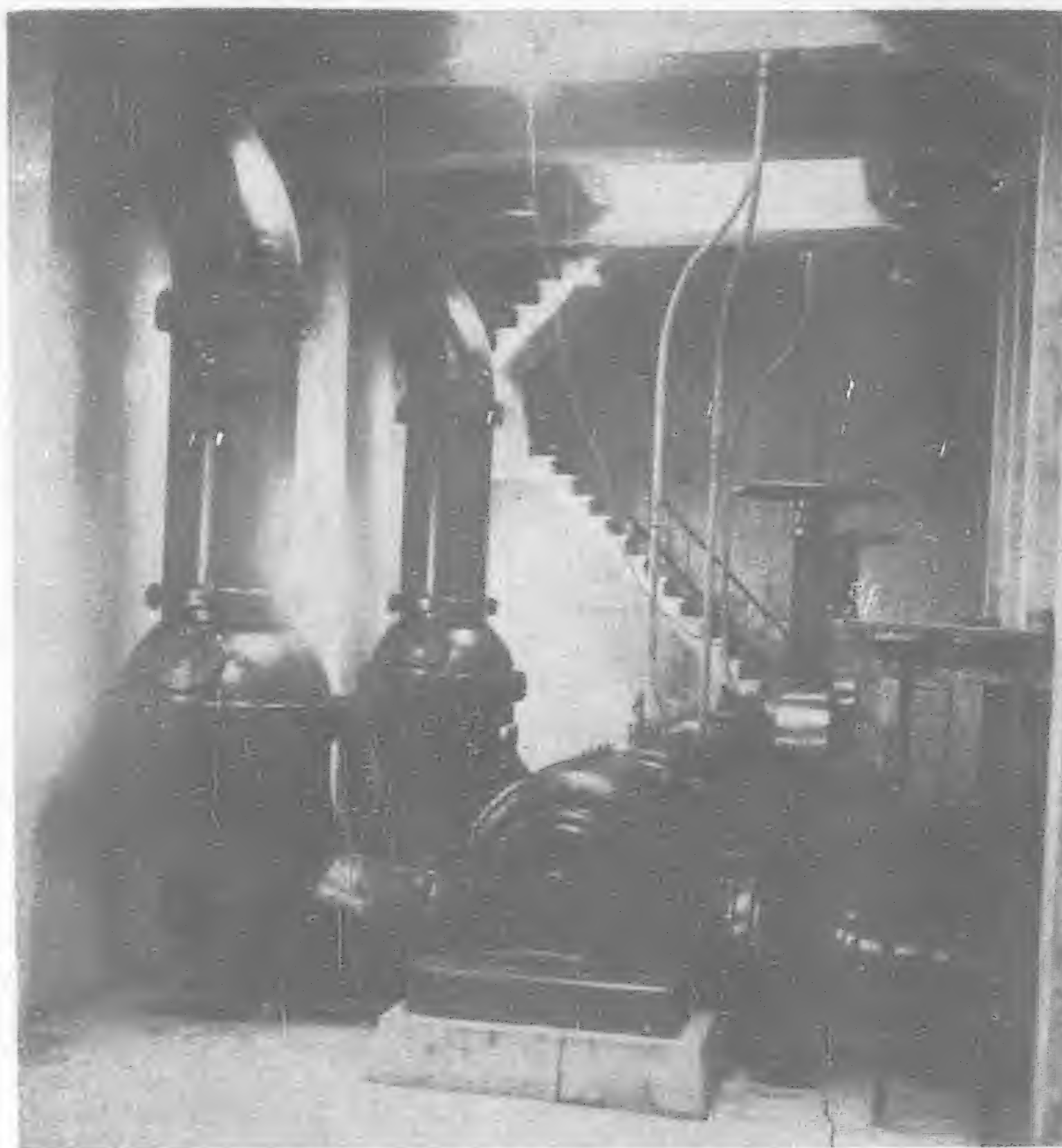
When the decision was made to build a large modern power plant for Hangchow the average daily peak-load of the existing plant was approximately 5,000 kilowatts and the rate of growth of load was estimated at 20 per cent per year.

Plans for Future Needs

The new plant is designed for an ultimate capacity of 64,000 kilowatts with one additional 16,000 kilowatt unit in reserve or a total installed capacity of 80,000 kilowatts. The initial installation consists of two units, each rated 7,500 kilowatts at 80 per cent power factor and 8,900 kilowatts at 95 per cent power factor, corresponding to 25,000 horse-power capacity of the two turbine arranged for operation as one unit of the ultimate plant.

There was only a comparatively short section of the left side of the Chien Tang river where an ample water supply was obtainable and with coal transportation facilities by rail, river and canal. The site selected is about one-third of a mile below the Zakow railway station. It is about three miles southwest of the city load center and the old plant is about three miles north-east of the city load center. Test piles were driven and data obtained on bearing values early in the year 1930.

The site purchased is 750-ft. long and 450-ft. wide. For the initial plant, and including space for an additional 16,000 kilowatt unit, an area of about 350-ft. wide and 350-ft. long required filling for an average depth of approximately 12-ft. This area was protected with a reinforced concrete bund along



No. 4.—Escher-Wyss Circulating Water Pumps

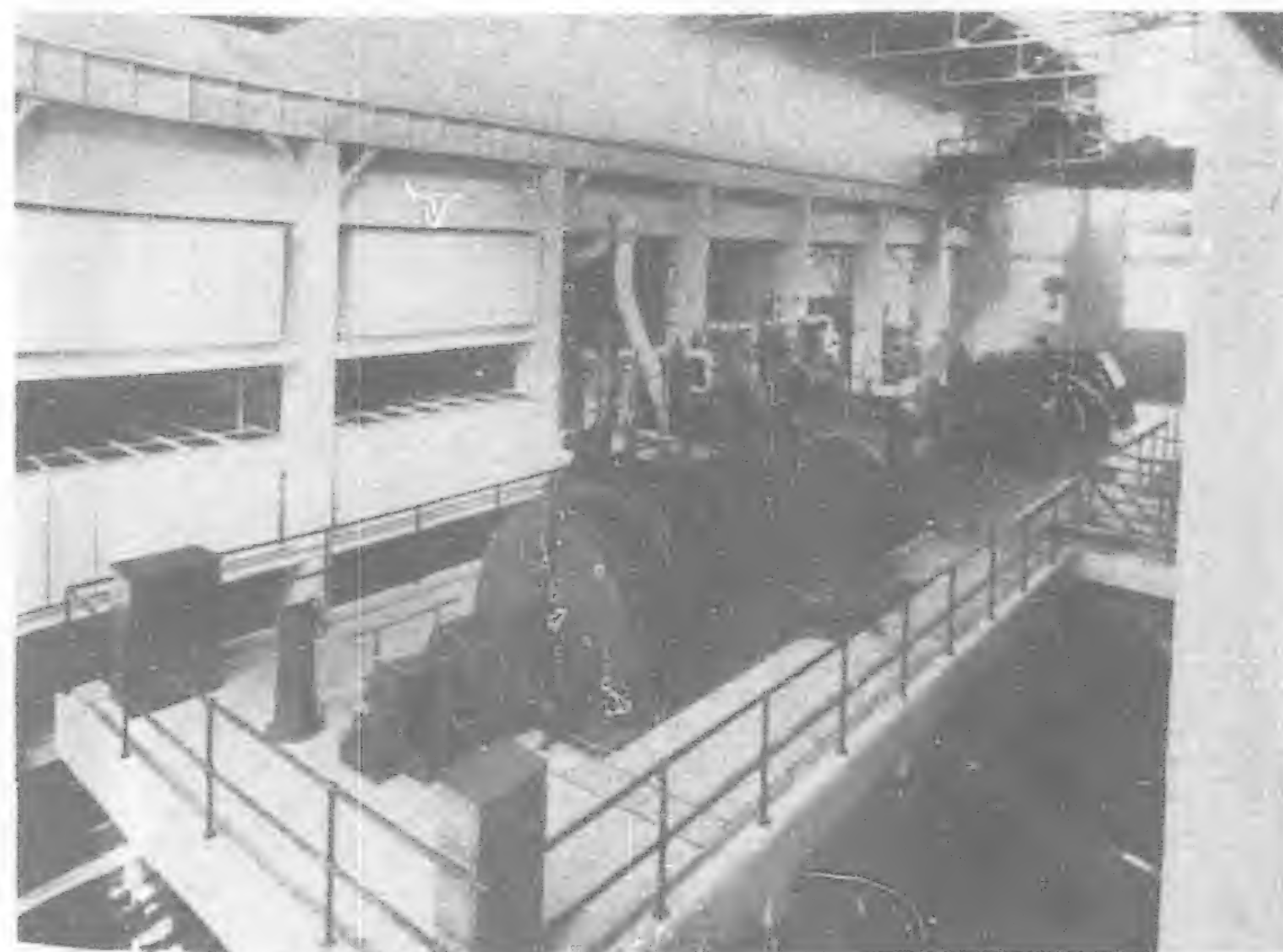


No. 5.—Power Plant Building looking north-west, with Offices and Laboratory in Foreground, Transformer Control House at left, Turbine Room at right and Boiler House extreme right

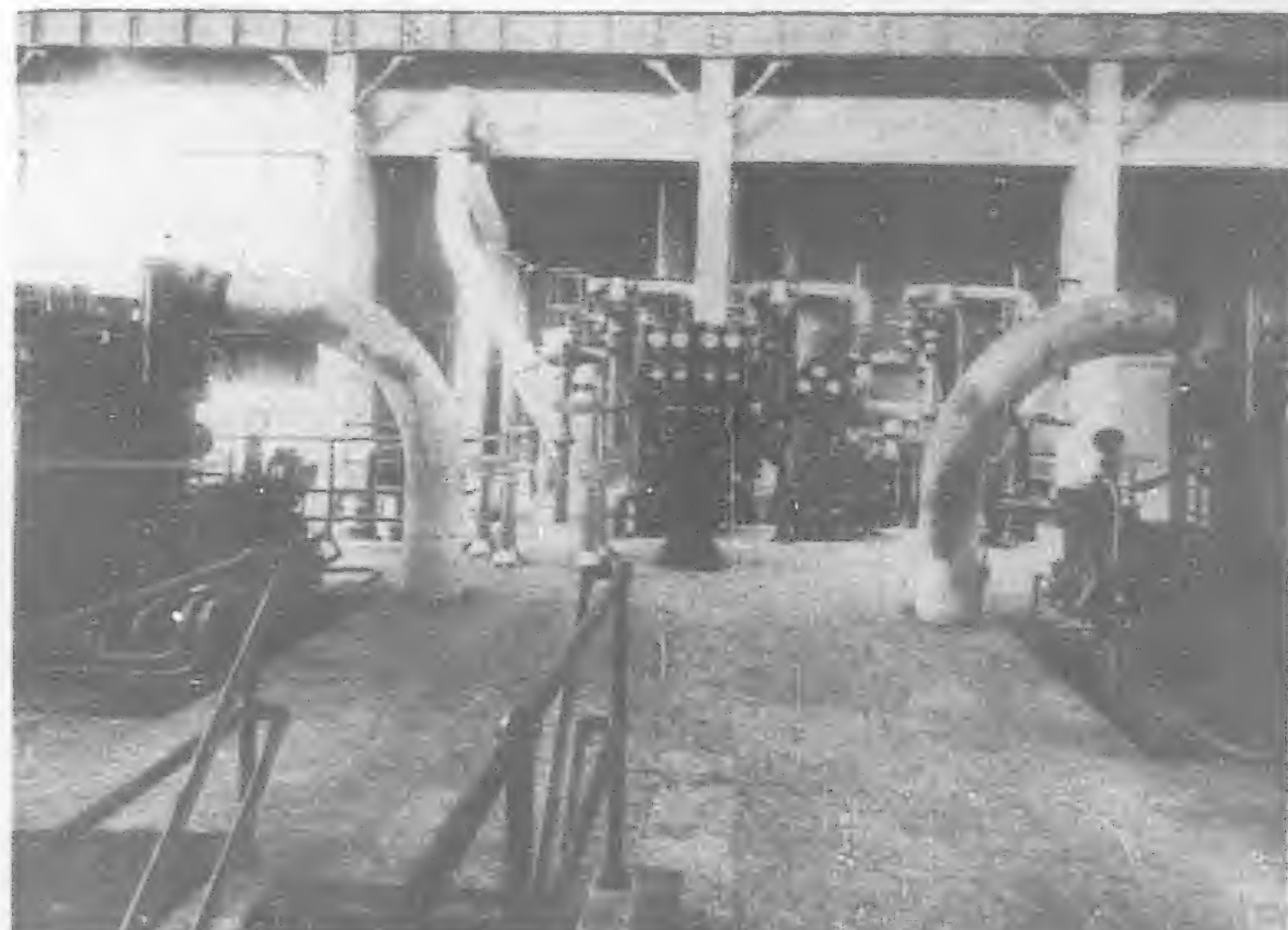
the normal line of river conservancy and with a stone-paved dyke at the downstream end. At the upper end a rubble stone wall was built to give added protection to the stone paved spur dyke and sheet piling structure provided to form a silting basin for the area purchased for future plant extensions. The plot plan is shown in drawing No. 1 and photograph No. 1 shows the upstream spur dyke and view No. 2 shows the bund and downstream protection.

The datum plane was selected as 1-ft. above highest high water recorded for the Chien Tang river. Foundation piling was driven from the minus 15-ft. level to the minus 56-ft. level and hardpan was reached at an average level of minus 32-ft. or 32-ft. below the present ground level. Reinforced concrete foundations for building and machinery and reinforced concrete discharge ducts and discharge apron and wing walls, including the reinforced concrete bund, were built on the piling at a level 16-ft. to 17-ft. below present ground level before the earth-fill was placed. During the pile driving operations a wooden cofferdam was built for the pump house chamber, the finished floor level of which is 22-ft. below ground level. Piling for the pump house was also driven to the minus 56-ft. level.

The recorded variation in the level of the water in the Chien Tang river is about 16-ft. The river is tidal at the plant site, subject to the same influence that causes the bore at the mouth of this river, whereby the flow has a duration of less than 10 per cent of the duration of the ebb. The maximum velocity of water in this river is,



No. 6.—View of Turbine Room from H.T. Control Switch-board Room



No. 7.—View of Turbine Control Floor with Gauge Boards and Worthington-Simpson Air Ejectors supplied by Escher-Wyss in center

therefore, upstream rather than downstream. This phenomena causes silt from the Yangtze river to be deposited in the channel of the Chien Tang river over 100 miles from the mouth of the Yangtze river. With the current at maximum velocity silt amounting to 4 per cent by volume is carried by the water and it was, therefore, deemed essential, for the protection of the condenser tubes, that submerged circulating water pumps be employed.

Details of Water Plant

The circulating water plant was designed to provide for velocities through condenser tubes equal to the velocity of water in the river channel. The pump chamber is designed for four motor driven circulating water pumps, of which two are installed—each having a capacity of 156,000 lb. of water per minute at 25-ft. head.

View No. 3 shows the pump house roof with portable hatchway covers and with hoisting gear for water intake gates and sliding screens.

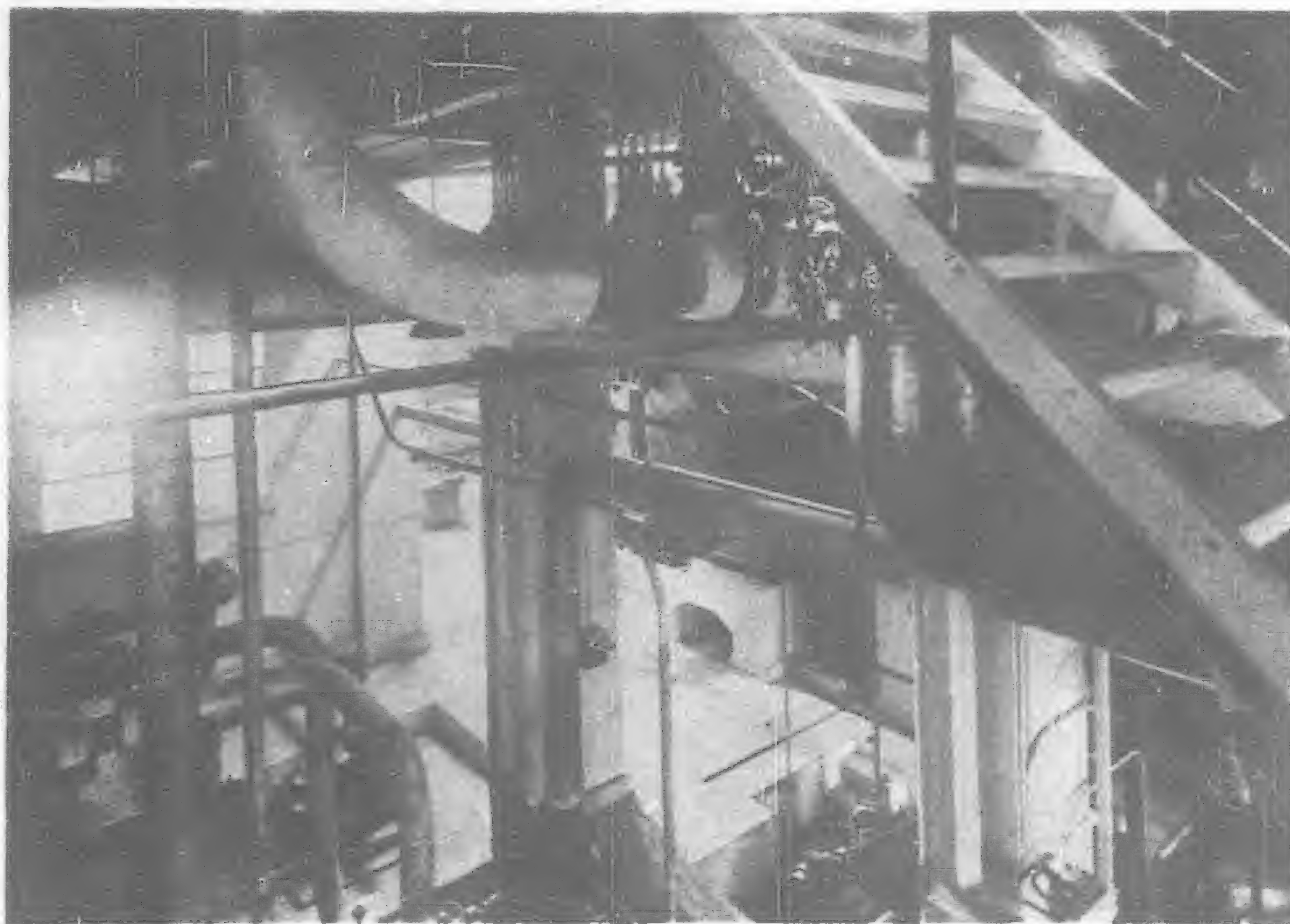
View No. 4 shows the motor-driven cir-

culating water pumps with inlet gate valves and multiport non-return discharge valves.

View No. 5 shows the power plant building with the boiler house on the right, the turbine house in the center and the office and laboratory building on the left and transformer and control house on the extreme left. For the boiler and turbine house a structural steel supporting frame was employed above ground level. The office, laboratory and transformer and control house is a reinforced concrete structure. The enclosing walls are built of wire-cut, rough texture face-bricks and the partitions are of hollow tile. Floors of office building, laboratory and control house and turbine room control space are of mosaic tile.

View No. 6, taken from the high tension switch-board room, shows the turbo-generator sets, air ejectors and auxiliary control board.

View No. 7 is taken from the entrance door of the office building to the turbine house and shows the operating space between turbine



No. 11—Showing Main Steam Control Valves, supplied by Liberty Valve Company, under Turbine Operating Floor

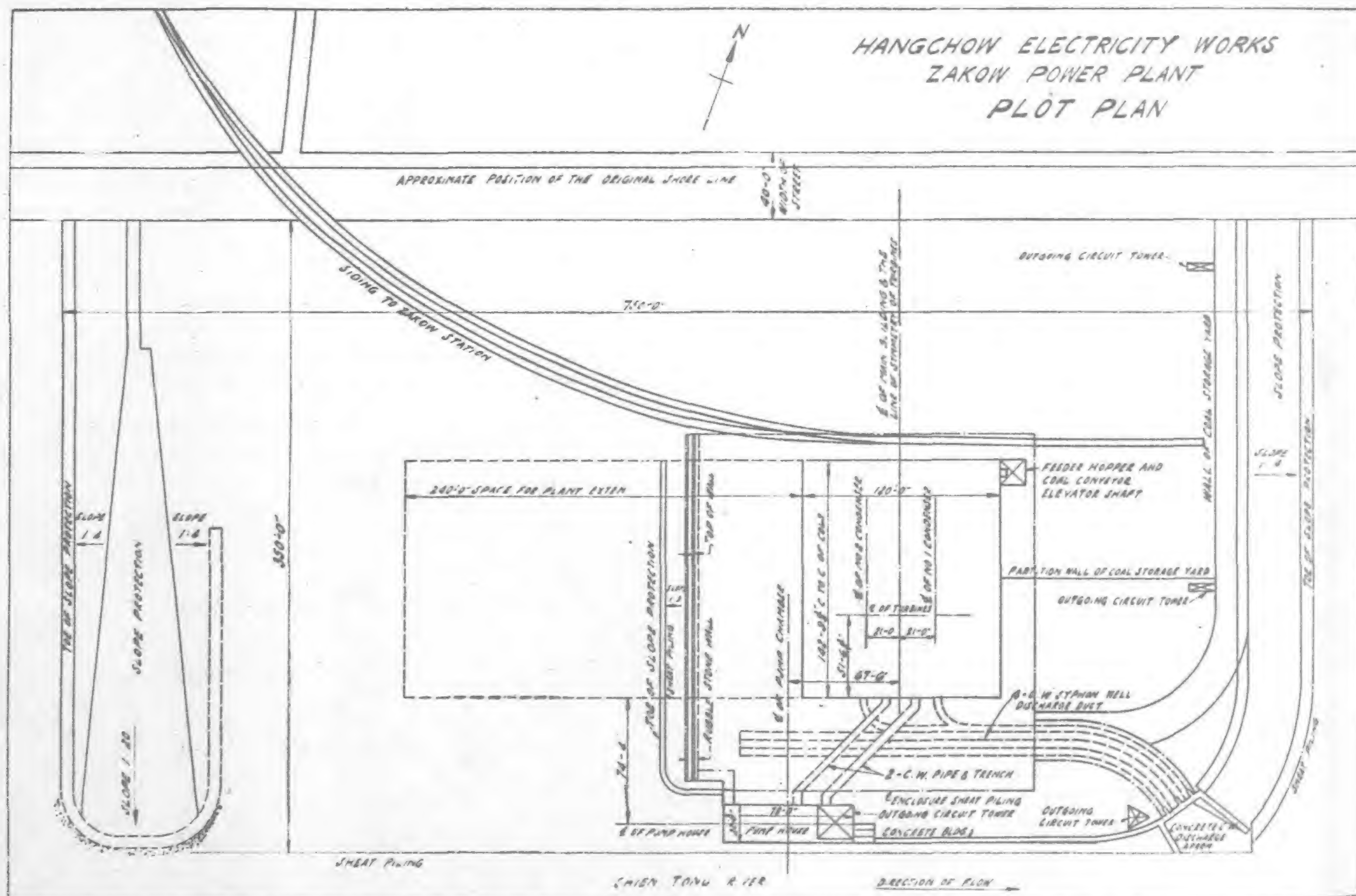


Plate No. 1

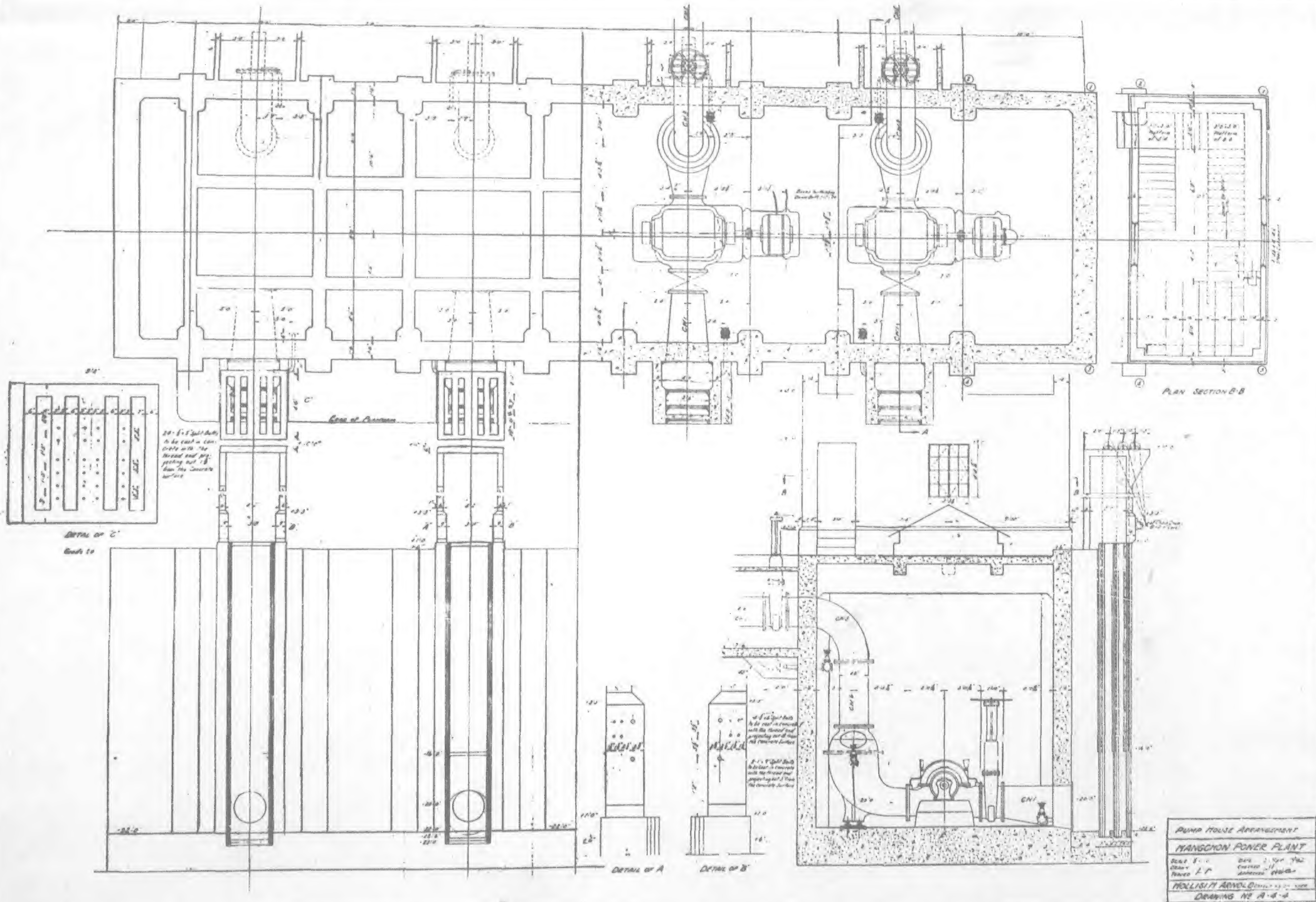


Plate No. 2

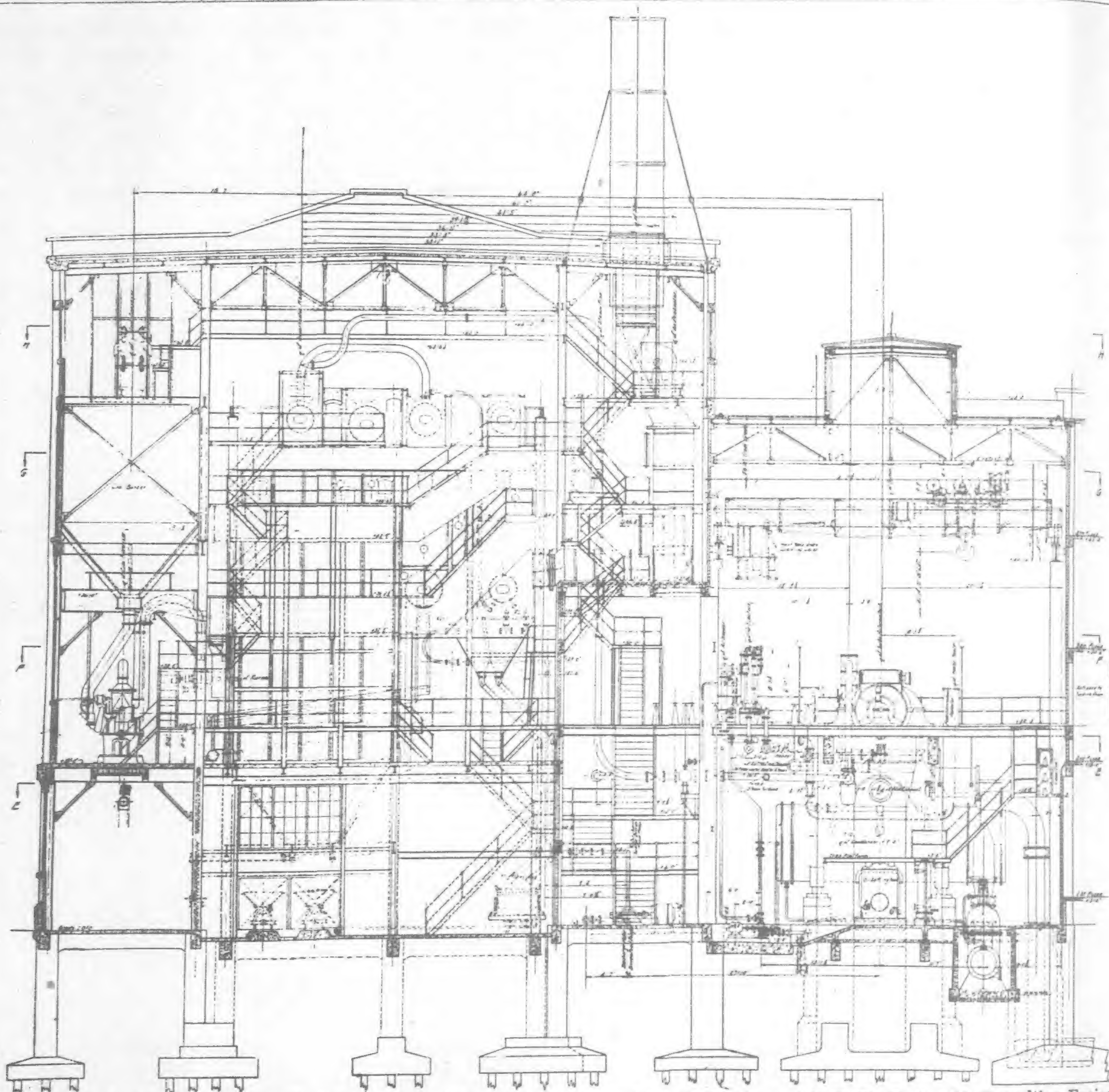
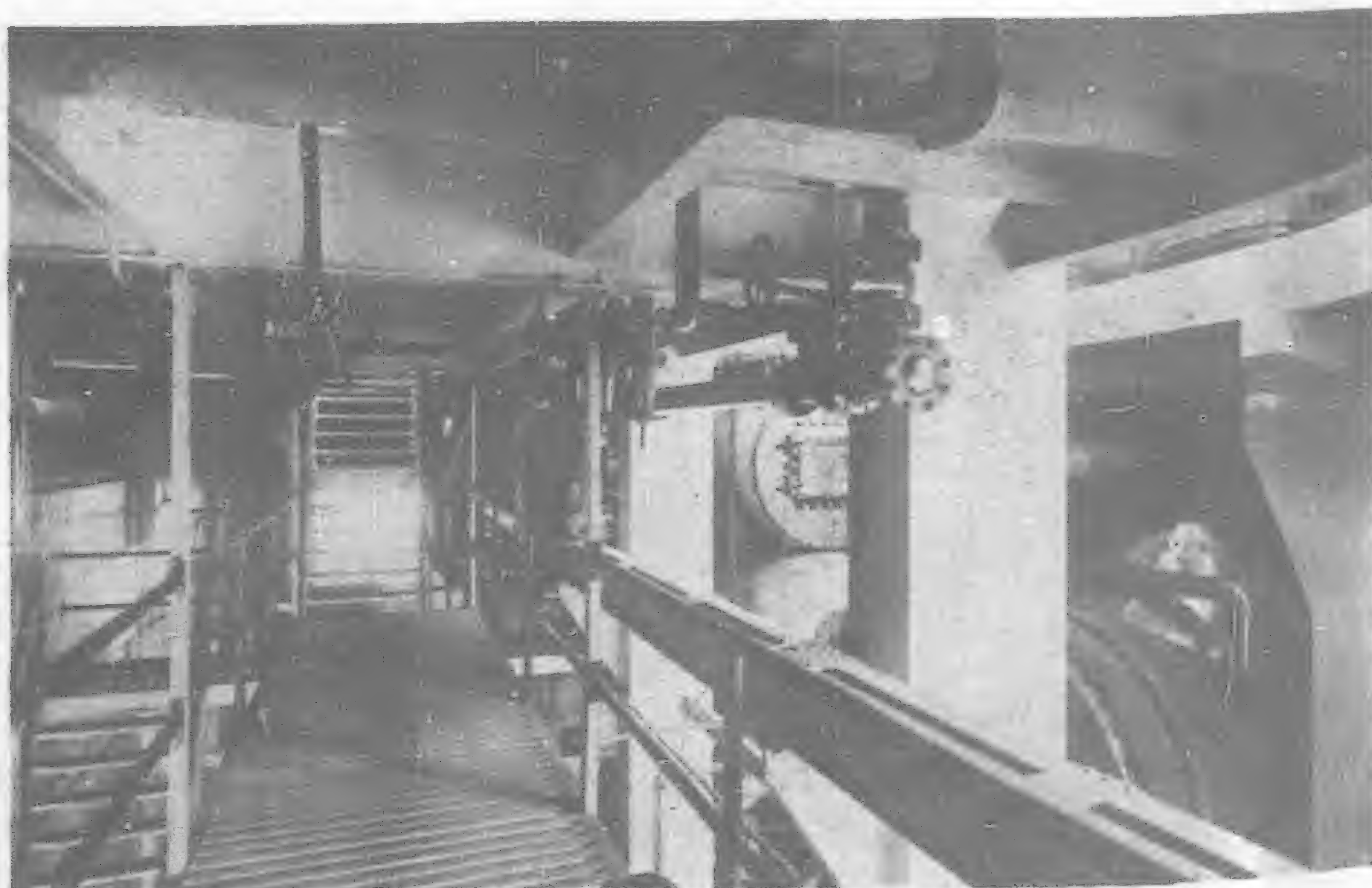


Plate No. 3.—General arrangement, Transverse section Hangchow Power Plant. Scale $\frac{1}{4}$ -in. to 1-ft. Hollis H. Arnold, Consulting Engineer



No. 8.—View of Condenser Circulating Water Piping Connections



No. 9.—View of Operating Platform for Water Tank Control Valves

No. 1 and turbine No. 2, and also air ejectors, gauge boards and evaporator.

The turbo-generator sets are of British Thomson-Houston Co. manufacture, eighteen stage impulse, designed for steam at 350 lb. per square inch gauge at a temperature of 700°F. and a vacuum of 28½ inches with steam extraction, from the 12th and 14th stages, for evaporating and deaerating feed water heating.

The gross steam consumption guarantees are 10.19 lb. per kilowatt hour with a load of 8,000 kilowatts at 80 per cent power

factor, 10.50 lb. per kilowatt hour with a load of 6,000 kilowatts at 80 per cent power factor and 11.27 lb. per kilowatt hour with a load of 3,000 kilowatts at 80 per cent power factor.

The peak of the daily load curve is formed by the lighting load and the power factor during peak load hours on the old plant is approximately 95 per cent. The turbo-generator sets for the new station are rated 8,900 kilowatts at 95 per cent power factor. The alternators are wound for 14,000 volts at full load and are equipped with direct connected exciters and auxiliary exciters. The

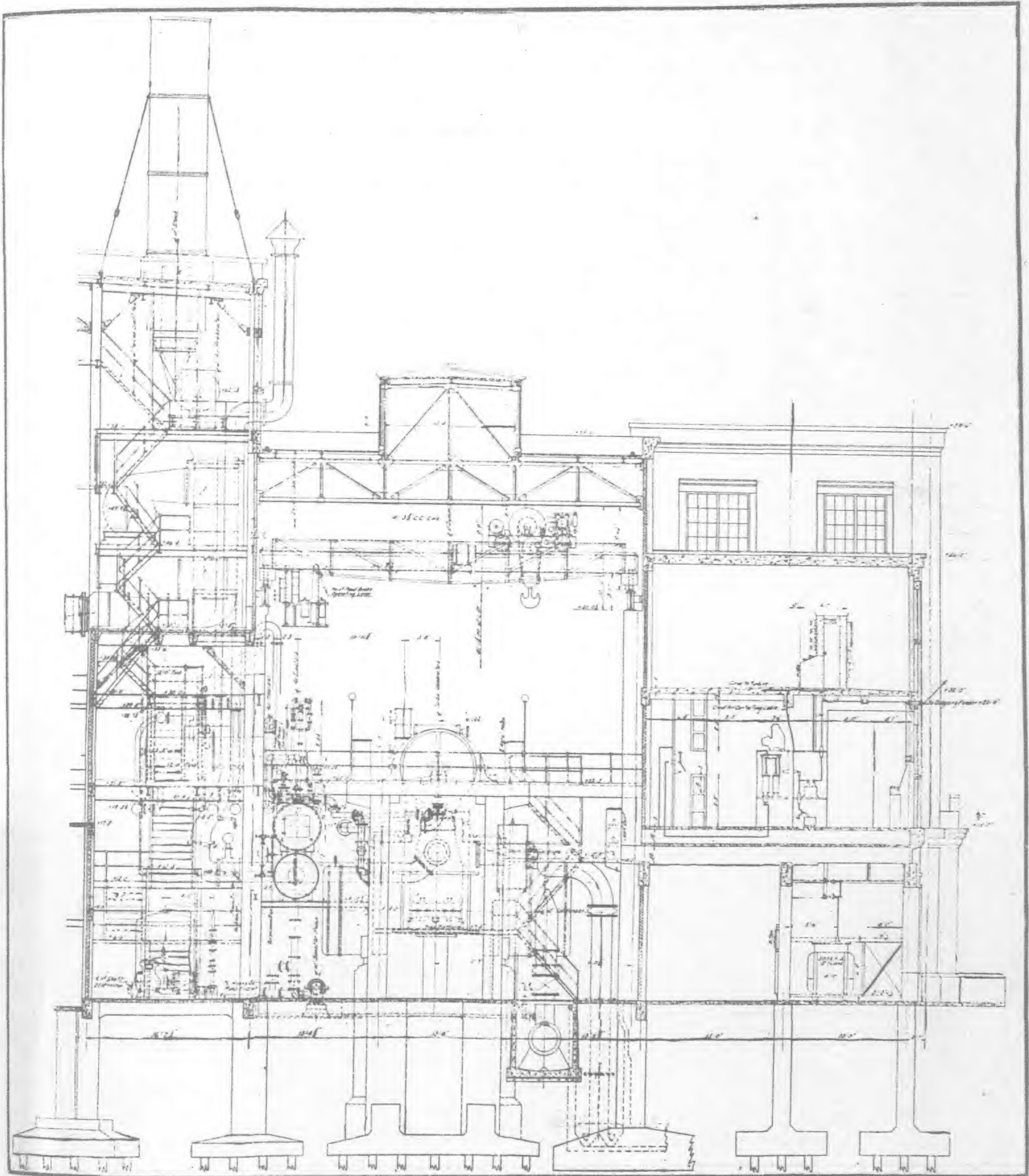
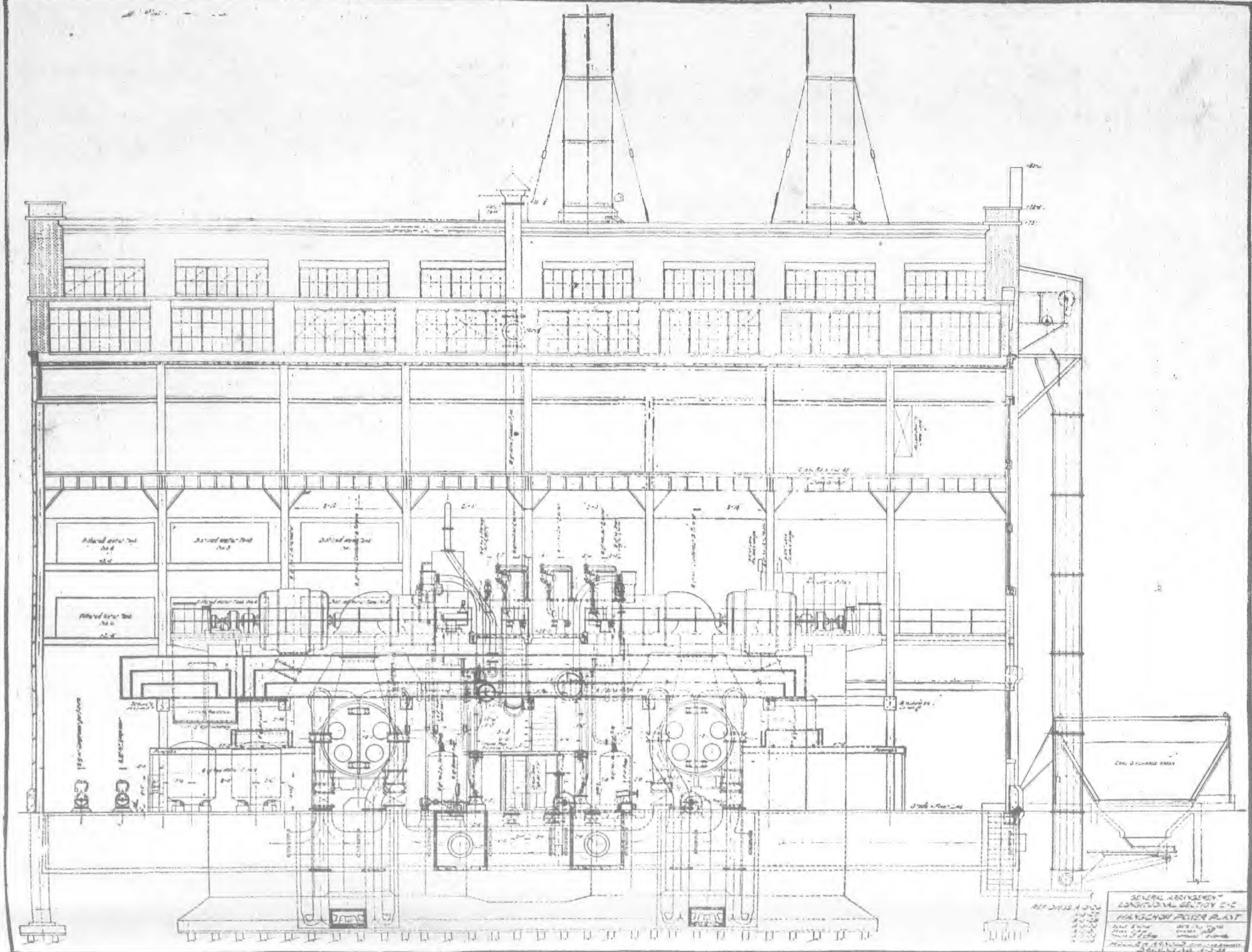


Plate No. 4.—General arrangement, Transverse section Hangchow Power Plant. Scale ¼-in. to 1-ft. Hollis H. Arnold, Consulting Engineer

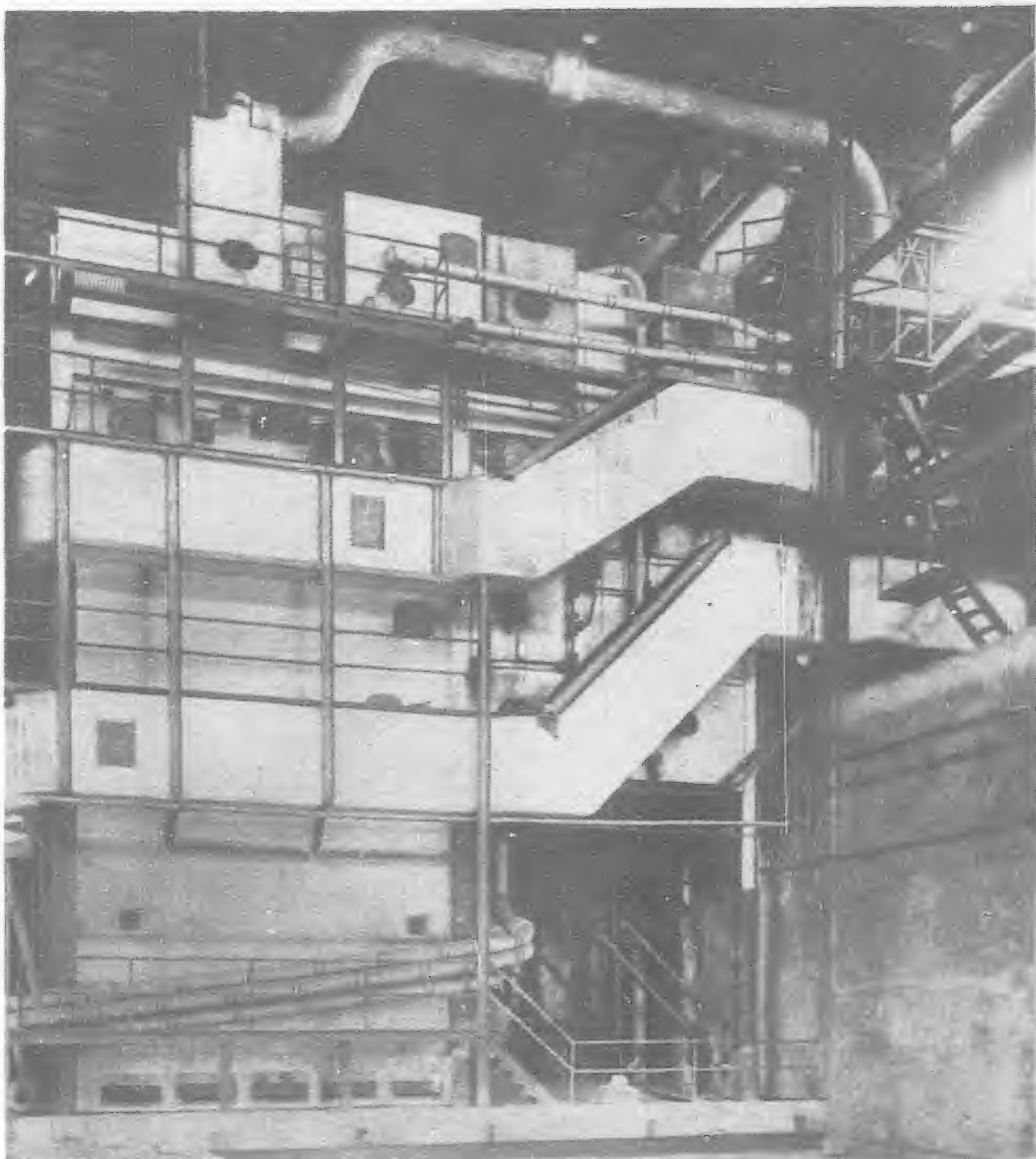


alternators are equipped with closed circuit air coolers with duplicate units utilizing circulating water from the condenser circulating water pumps.

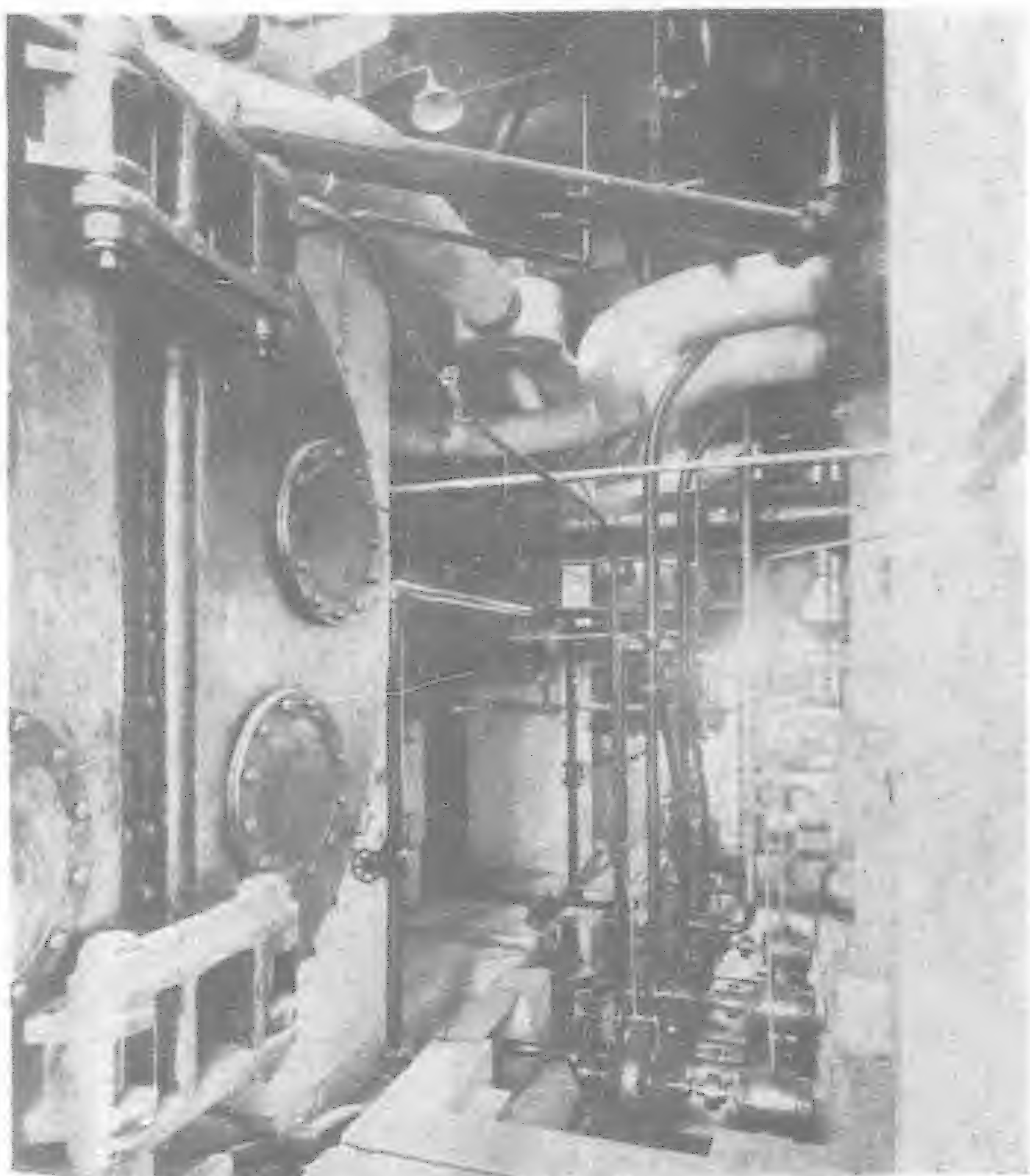
The tie lines to the old station and to the city transformer stations are designed for the same voltage and capacity as the alternators. 70,000-volts potential was selected for transmission lines for the rural distribution with step-up transformers for 14,000-volts to 70,000-volts.

The alternating current generators are designed for a short circuit current equal to eight times full load current and all 14,000-volt oil switches and auxiliaries are guaranteed to have a rupture capacity exceeding 500,000 kva with British standard duty cycle. Overload protection consists of automatic field suppression and inverse definite minimum time limit overload relays and circulating current protection relays. 14,000-volt oil switches are D.C. motor operated and spring actuated. All 14,000-volt connections from alternators to buses, also buses and outgoing line connections, are bare copper mounted on post insulators in concrete steel frame compartments.

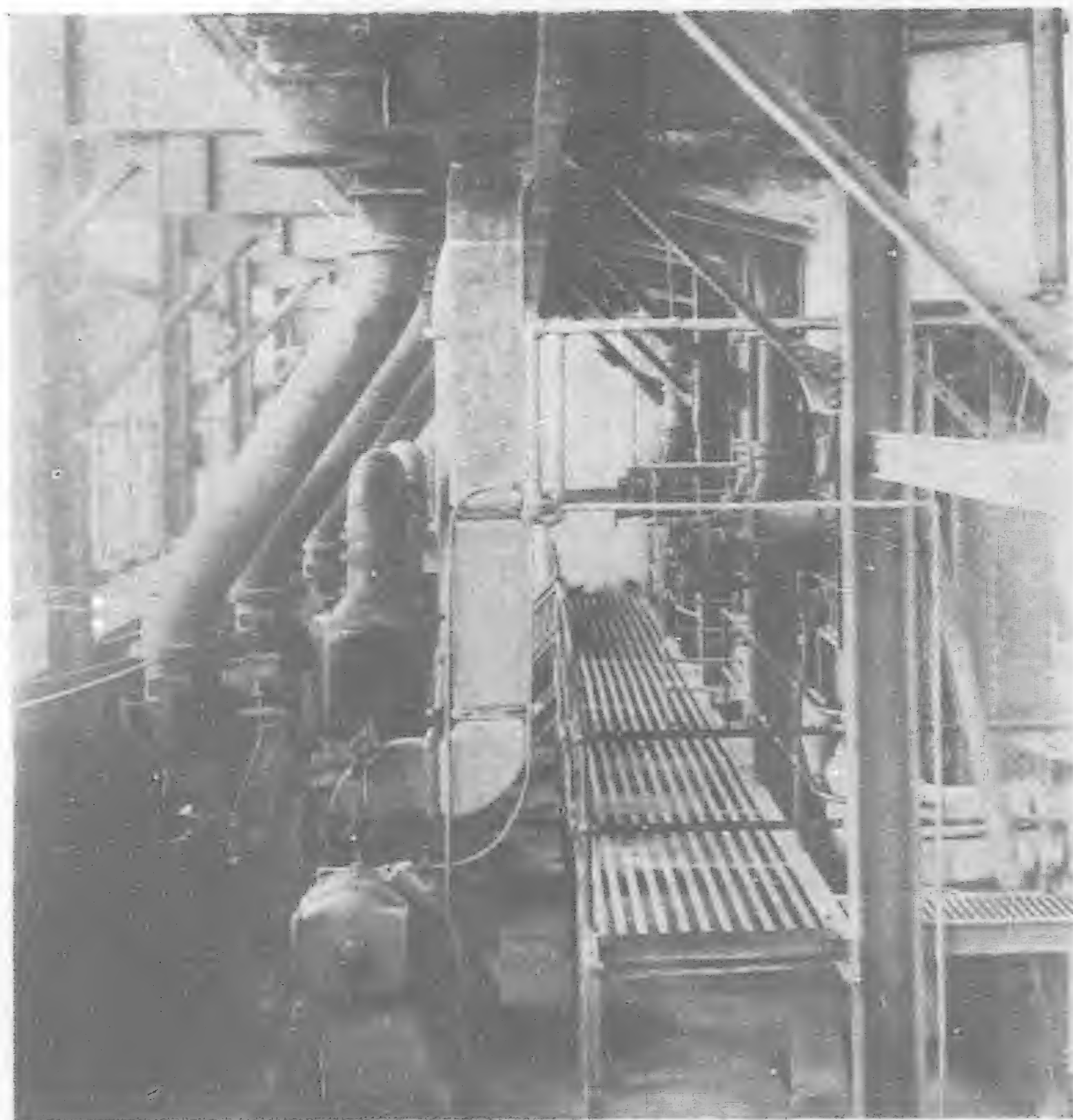
For station auxiliaries three single phase, 500 kva, 14,000-volt/600-volt station transformers are connected delta-delta with switching arrangement for open delta operation so that anyone of the transformers may be disconnected for inspection or repairs. Station auxiliaries are driven by 550-volt motors with double squirrel cage windings, designed for full voltage starting and without overload protection except that one circulating water pump and fan motors have wound rotors with drum controllers for speed control. Station auxiliary motors are controlled from the auxiliary control switchboard on the turbine operating floor and each motor is equipped with an ammeter for reading current in each phase and all motors are equipped with



No. 13.—View from Pulverizer floor of Boilers supplied by Combustion Engineering Corporation



No. 10.—Showing Worthington Hot-Well Pumps supplied by Escher Wyss and Piping under Turbine Operating Floor



No. 14.—View of Pulverizers and Burners and Supports for Coal Bunker

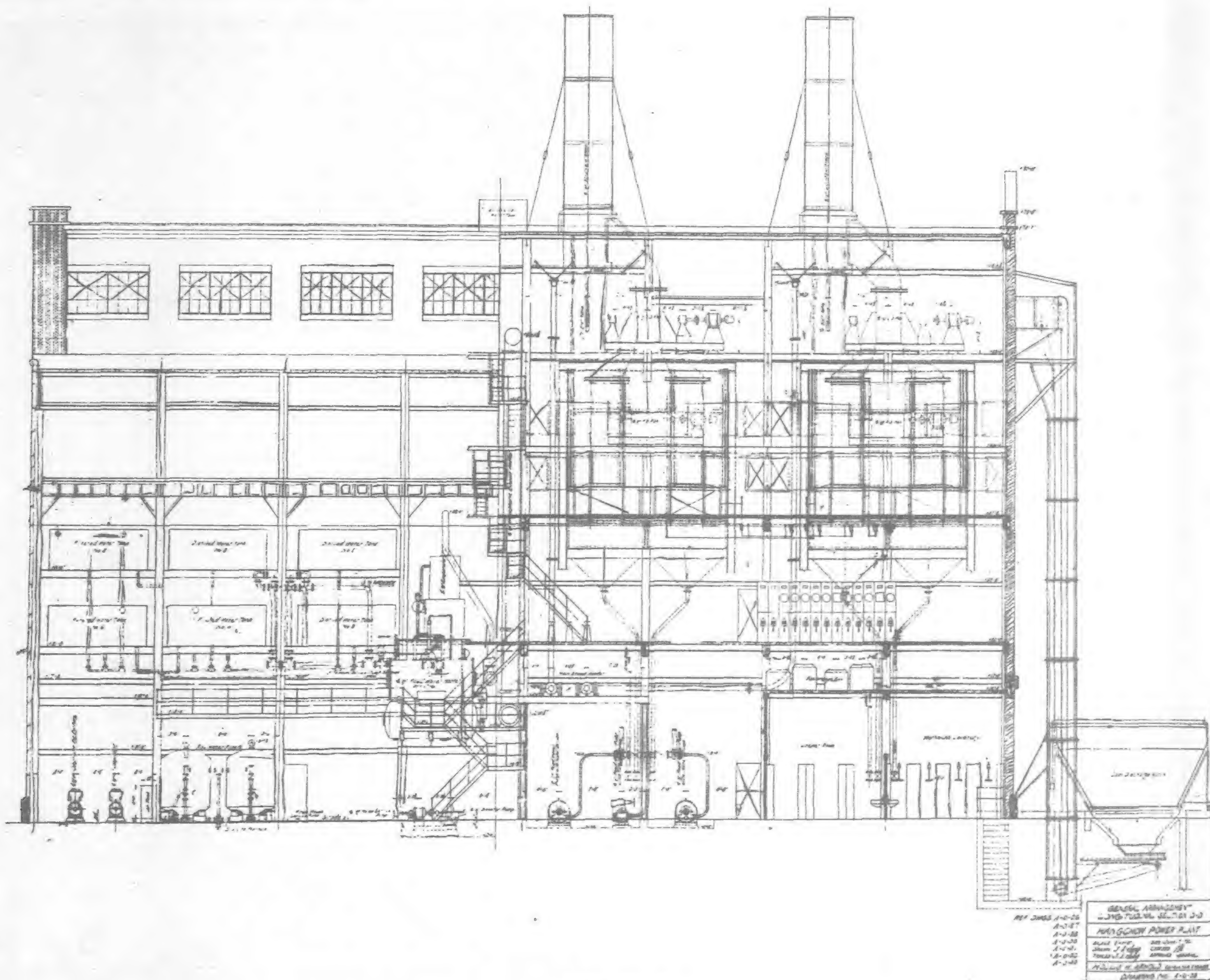
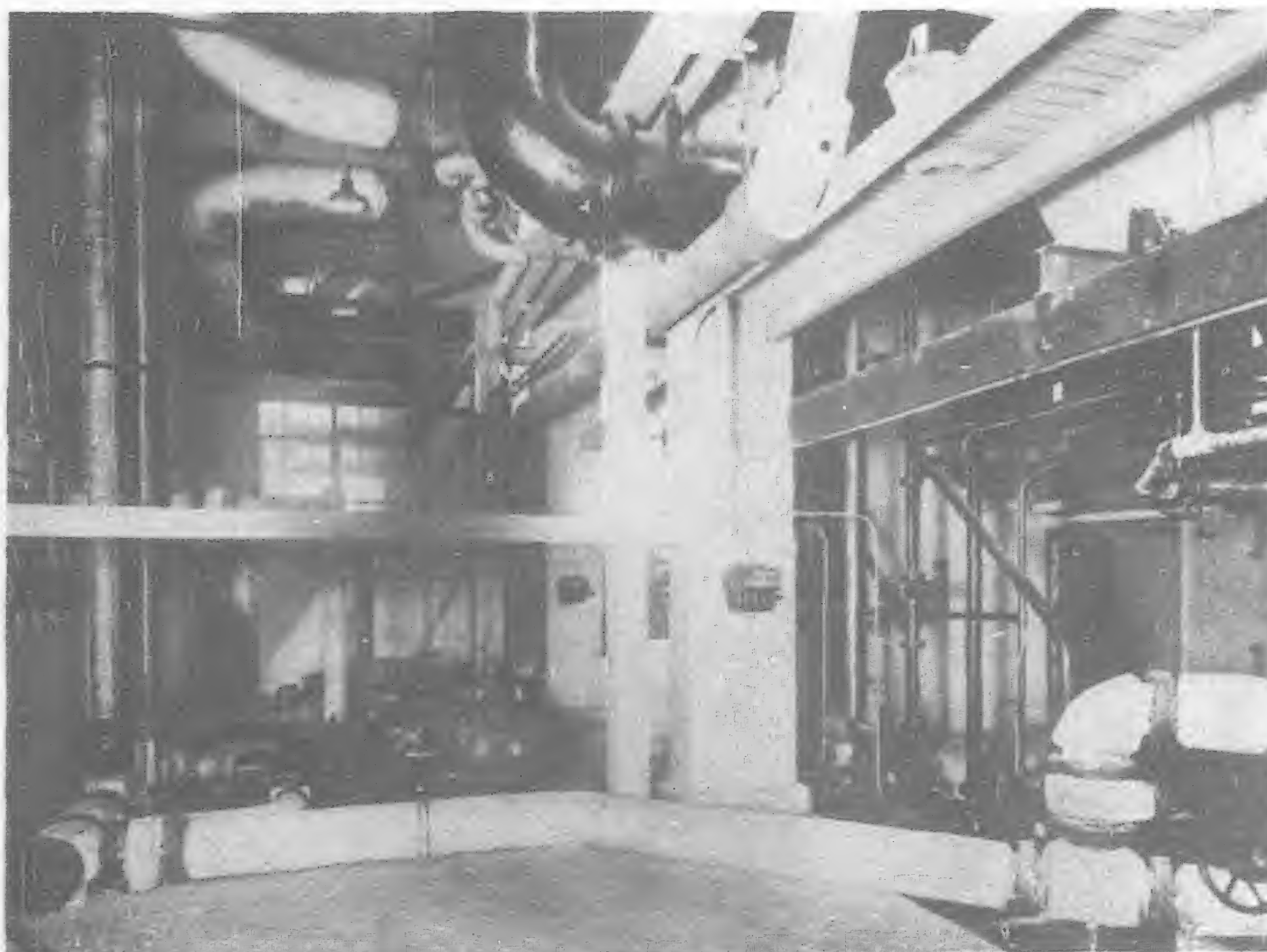


Plate No. 6

thermometers on bearings and windings.

Steam is extracted from the 12th stage to the make-up water evaporator and the vapors from the evaporator and steam from the 14th stage of the turbines are utilized for heating the feed water to a temperature of 140°F. at quarter load and 200°F. at full load. A booster pump is employed for extracting water from the feed water heater and discharge to feed water pumps. There are two DeLaval motor driven feed pumps operating at 3,000 r.p.m. and one Sulzer turbine driven boiler feed pump operating at 3,000 r.p.m., each having a normal capacity of 100,000 lb. of boiler feed water per hour.



No. 12.—View of Boiler Feed Pumps supplied by Messrs. De Laval and Sulzer Bros.

The Condensing Plant

The condensing plant is Escher Wyss manufacture, divided-shell, two-pass, arranged for circulating water first passing through the upper tubes and then through the lower tubes. Each condenser has an effective cooling surface of 13,000 sq. ft., consisting of 1-in. No. 18 B.w.g. muntz metal tubes 18-ft. 6-in. long, with muntz metal tube plates 1½-in. thick and 10-ft. in diameter, with tubes expanded at one end and equipped with ferrules and special packing in the other tube plate. Condensers are spring supported and equipped with taper exhaust connections from turbine

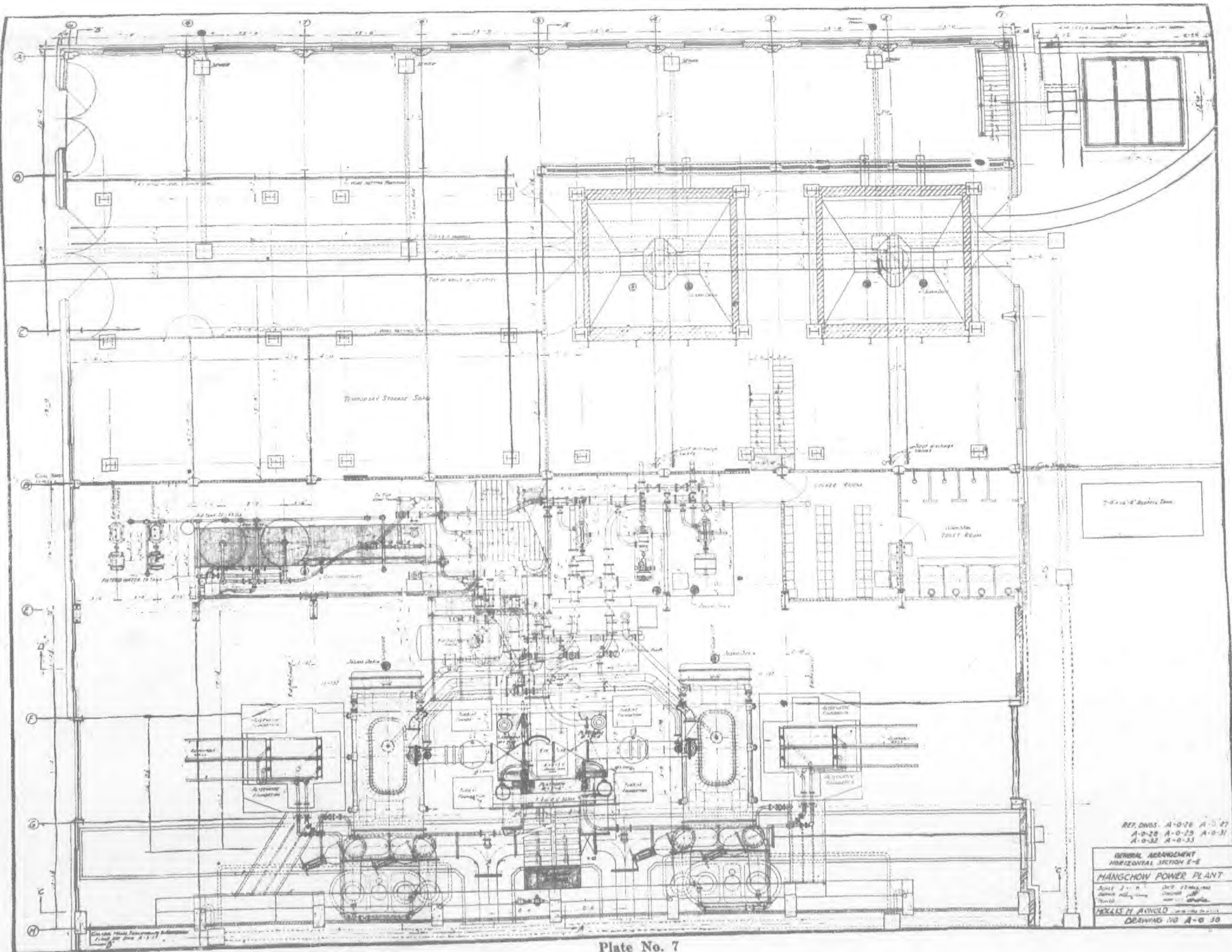


Plate No. 7

exhaust casing flanges to condenser shells. Condensers are guaranteed to maintain a vacuum of 28½-in. measured at the turbine exhaust flange with barometer at 30-in. when condensing steam corresponds to full load requirements of turbines and with circulating water at a temperature of 78°F.

View No. 8 shows circulating water pipe connections to condensers and air-coolers.

View No. 9 shows operating platform for control of filtered and distilled water tank piping.

View No. 10 shows hot-well pumps and booster pump.

View No. 11 shows main steam piping and feed water piping under turbine control floor.

View No. 12 shows the boiler feed pumps.

The hot-well pumps are two stage, horizontal, split casing, volute impeller centrifugal pumps.

The two stage air ejectors are mounted on the turbine operating floor.

There are three sets of hot-well pumps, boiler feed pumps and steam ejectors, one of which is connected to function as a reserve for either of the other two.

Valves, for high pressure steam from boilers and to turbines and to auxiliaries, with by-pass valves; and also turbine steam extraction control valves and air-ejector steam, water and air valves are arranged for operation from the turbine operating floor. Tank piping is arranged for continuous water rate testing with volumetric measurement.

The Boiler Plant

View No. 13 shows the side of boiler and furnace.

The initial boiler plant consists of two four-drum inclined-tube boilers arranged for four passes of gas with two-drum integral economizers arranged for two passes of gas and with superheaters in the first pass of the boilers. Each boiler has 10,400 sq. ft. of heating surface and 4,060 sq. ft. of economizer heating surface.

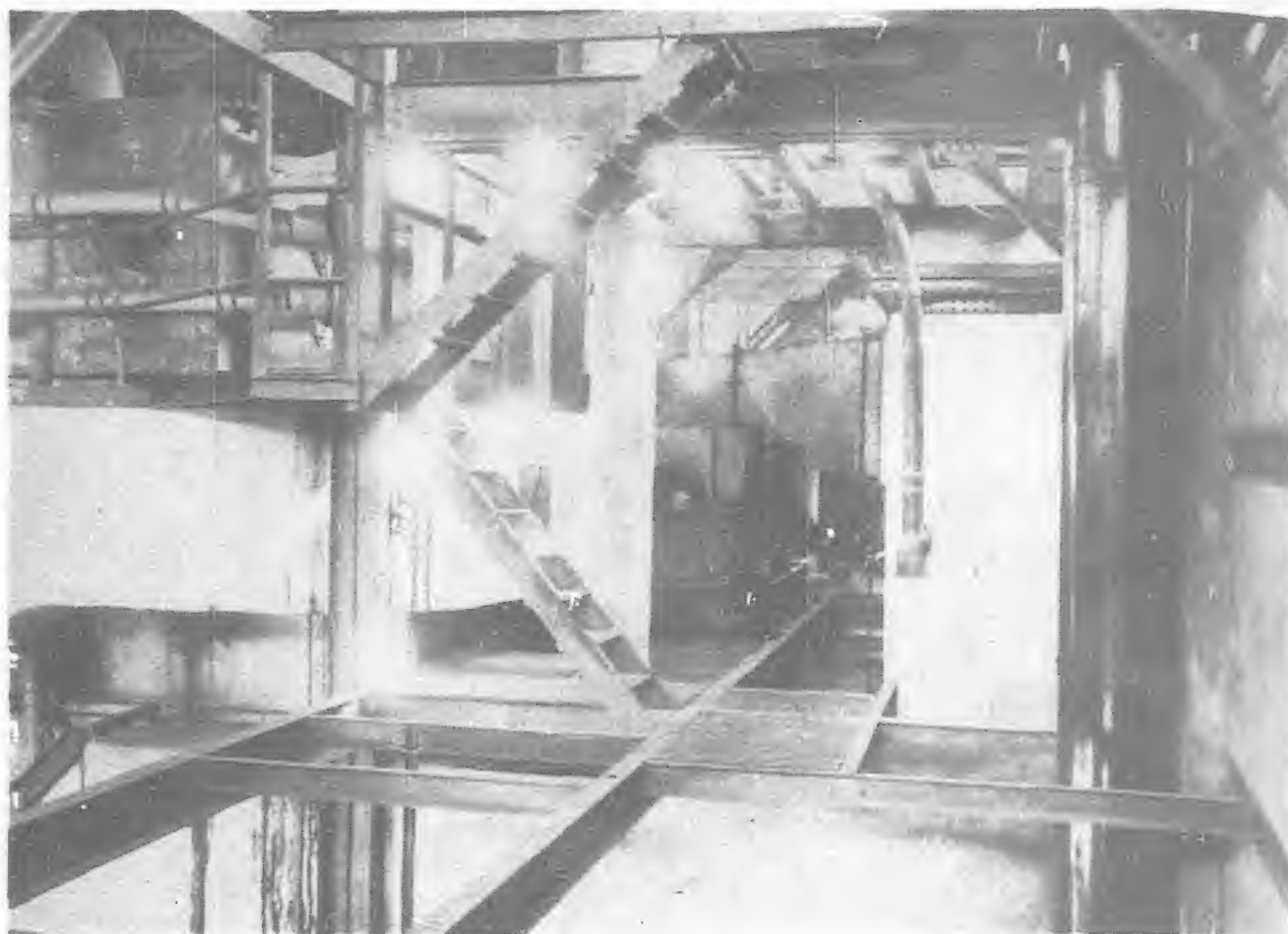
The total steam temperature guarantees are—

706°F. at 30,000 lb. evaporation

716°F. „ 45,000 „ „

and 726°F. „ 60,000 „ „

Boilers and economizers are equipped with Bayer Co. soot blowers.



No. 15.—Showing Double Inlet Forced Draft Fans and Intake Duct from Air-Cooled Furnace Walls and Discharge Duct to Burners. Equipment of American Blower Company

The furnaces have inside dimensions of 18-ft. width, 16-ft. depth and a height of 34-ft. above the water screens. Furnace walls and arches are of the Bigelow-Liptak suspended type air-cooled, except the rear of the furnaces—which are water walls. Below the water screens double inverted pyramid ash-hoppers are provided for discharging ashes into ash-cars. The centers of the bottom boiler and economizer drums are 38½-ft. above ground level and the ash-gates are 9-ft. above grade to permit of easy handling of cleaning tools.

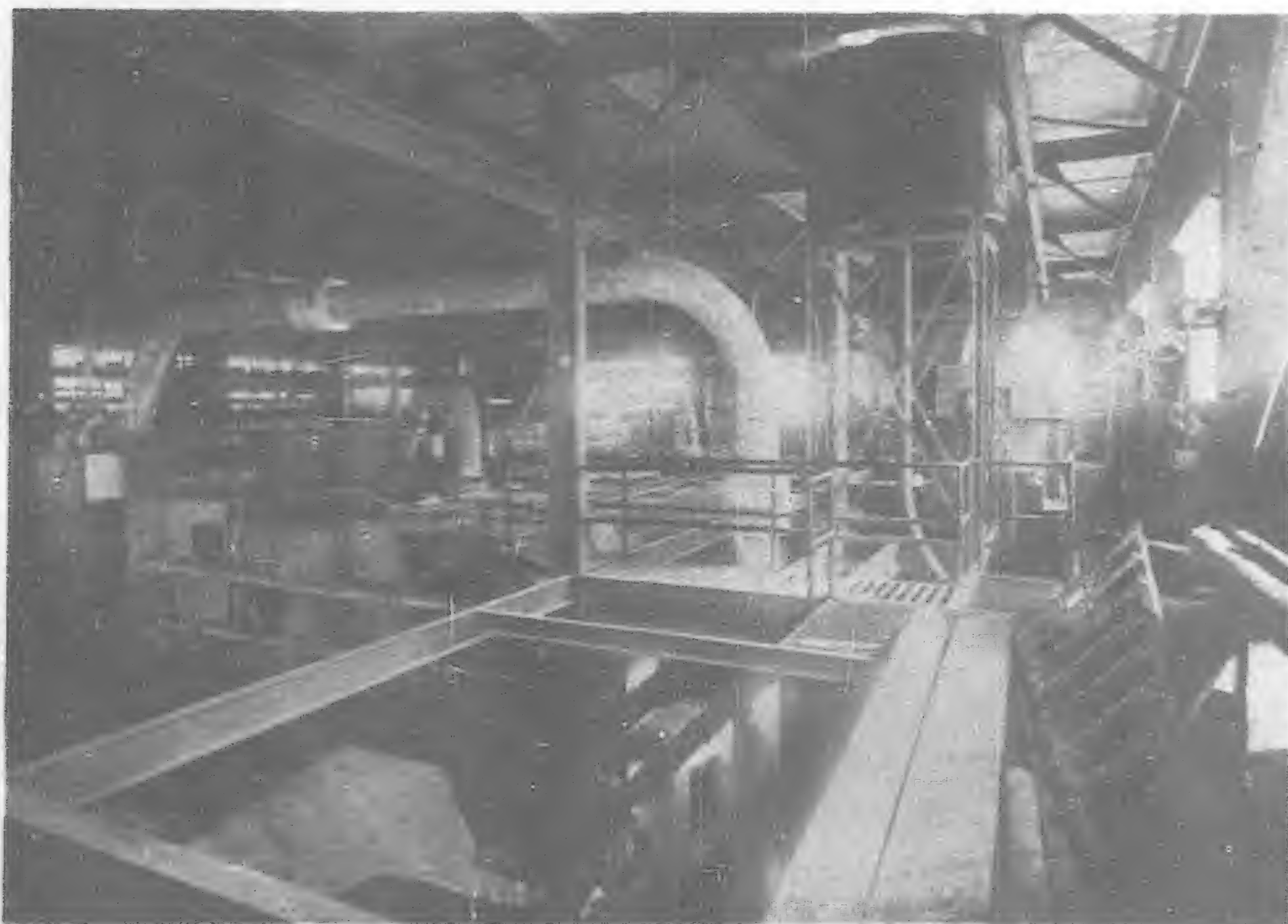
View No. 14 shows the pulverizers and burners and supporting frame of 1,000 ton capacity coal bunkers.

Pulverizers and burners were also furnished by the Combustion Engineering Corporation and each boiler furnace is equipped with two Lapulco unit type pulverizers and turbulent type pulverized fuel burners. The normal capacity of each pulverizer, with fuel as specified, is 6,000 lbs. per hour. The normal capacity of boiler plant and auxiliaries conforms to the guaranteed normal capacity of the pulverizers.

Fuel, as specified for performance guarantee tests, has a heat content, as fired, of 10,100 B.t.u. per pound, corresponding to a heat transfer of 98,172,000 B.t.u. per hour at guaranteed pulverizer and boiler efficiency, which at boiler plant rated steam pressure temperature and feed water temperature corresponds to boiler capacity of 8,181 lb. per hour. It is expected that this plant will operate with an average load of 6,000 to 8,000 kilowatts with a daily load factor of approximately 50 per cent, with a net fuel consumption, per kilowatt hour—measured at the switch-board, of approximately 1.65 lb. of fuel, having a heat content, as fired, of 10,100 B.t.u. per pound. The power required for auxiliaries with a load of 8,000 kilowatts is expected to be approximately 450 kilowatts. Each pulverizer is driven by a 75 h.p., four pole motor, operating at 1,460 r.p.m. Pulverizers operate without noise or vibration.

View No. 15 shows the forced draft fans and air ducts.

Double inlet, double width, high speed American Blower Company forced draft fans draw air from the air-cooling ducts of the furnace walls and discharge air for combustion through chambers provided for future addition of plate type air preheaters and through ducts to burners and pulverizers.



No. 16.—Showing top of Boilers, supporting structure for Stacks and Forced Draft Fans

View No. 16 shows the induced draft fans and connections to bases of stacks and also top of boilers and the coal conveyor.

The induced draft fans are American Blower Company stream-line double inlet—two-thirds double width—drawing flue gas from outlet of economizers and up through chambers provided for future air preheaters and with fan discharge to steel stacks supported on the building structural steel. The bases of motor driven forced draft fans and induced draft fans are mounted on spring supports which effectively dampen the vibration and noise from the fans and motors so that no vibration or noise can be detected in the operating floor directly below the fans. The forced draft fans operate at a tip speed of 15,000-ft. per minute and the induced draft fans at a tip speed of over 6,000-ft. per minute. The motors for each fan are rated 75 h.p.

With conditions now existing in the Barge Canal and Chien Tang river forming, respectively the north and south boundaries of the plant site, it is more economical to deliver coal by rail and a double track siding has been built from the Zakow station through the coal storage yard of the plant. Coal is discharged from cars to the coal elevator feeder hopper and a Jeffrey Manufacturing Co. elevator conveyor is installed to deliver coal to the bunkers having a

capacity of slack coal, of dust size, of approximately 1,000 tons. A coal yard capacity has been provided for 9,000 tons.

On the auxiliary control switch-board of the turbine operating floor indicating, integrating and recording instruments and meters are provided for measuring boilerfeed water steam generated in each boiler and steam consumed in each turbine, steam and water temperatures and pressures, flue gas and combustion air temperatures and pressures and flue gas CO₂. Fuelfeeder motor control and combustion air and flue gas draught control are also located at this position. Boiler water level indicators are also provided at this place.

Drawing No. 2 is the pump house arrangement.

Drawing No. 3 is transverse section of turbine house and boiler house through the center of the building.

Drawing No. 4 is transverse section through control and transformer house and turbine house and auxiliary bay through east end of existing building.

Drawing No. 5 is the longitudinal section of turbine house from the south side.

Drawing No. 6 is the longitudinal section of turbine house from the north side, showing auxiliaries and auxiliary control board.

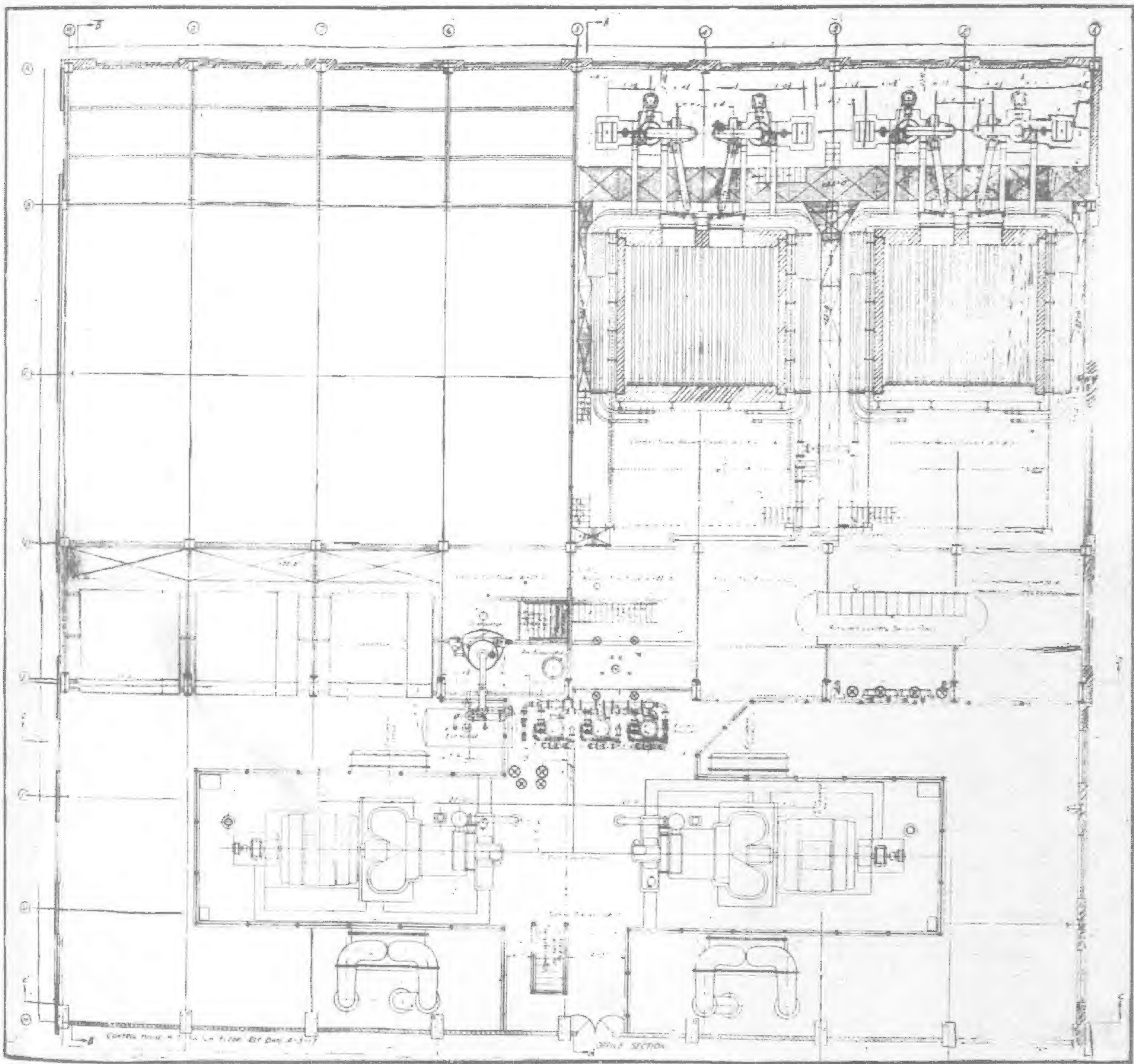


Plate No. 8.—General arrangement, Transverse section Hangchow Power Plant. Scale 1/4-in. to 1-ft. Hollis H. Arnold, Consulting Engineer

Drawing No. 7 is the horizontal section below the turbine operating floor showing ground floor.

Drawing No. 8 is the horizontal section showing the main operating floor of boiler and turbine house.

Drawing No. 9 is the horizontal section at the level 50-ft. above the ground.

Special Features

The special features of the designs are:—

The centralization of control under the observation of one chief operator.

The placing of heavy loads on beams of short spans.

Short sectionalized piping.

Light and well ventilated operating spaces. The photographs were all taken with natural light.

Duplication of auxiliaries and other provisions for the maximum degree of reliability for continuous operation and for maintaining plant efficiency consistent with test performance.

To be in conformity with manufacturer's performance guarantees the net thermal-efficiency of the plant must be greater than 20 per cent, using coal containing over 24 per cent ash and 6½ per cent moisture.

To keep the annual charges at the rate of 16½ per cent of the amount representing the total cost of the plant no more than the fuel cost. This will necessitate an average load of 6,000 kilowatts during the assumed period for the useful life of the plant.

To make ample provision for extensions. The height of the turbine floor is suitable for 16,000 kilowatt turbo-generator sets and condensers. The height and capacity of the crane is suitable for 16,000 kilowatt machines. The boiler room has space for two additional boilers and foundations have already been provided. The control house has space for an additional 16,000 kilowatt unit. Future extensions may be made with a minimum of interference in the operation of the existing plant and an additional 16,000 kilowatt unit may be installed at approximately one-half of the cost of the initial unit.

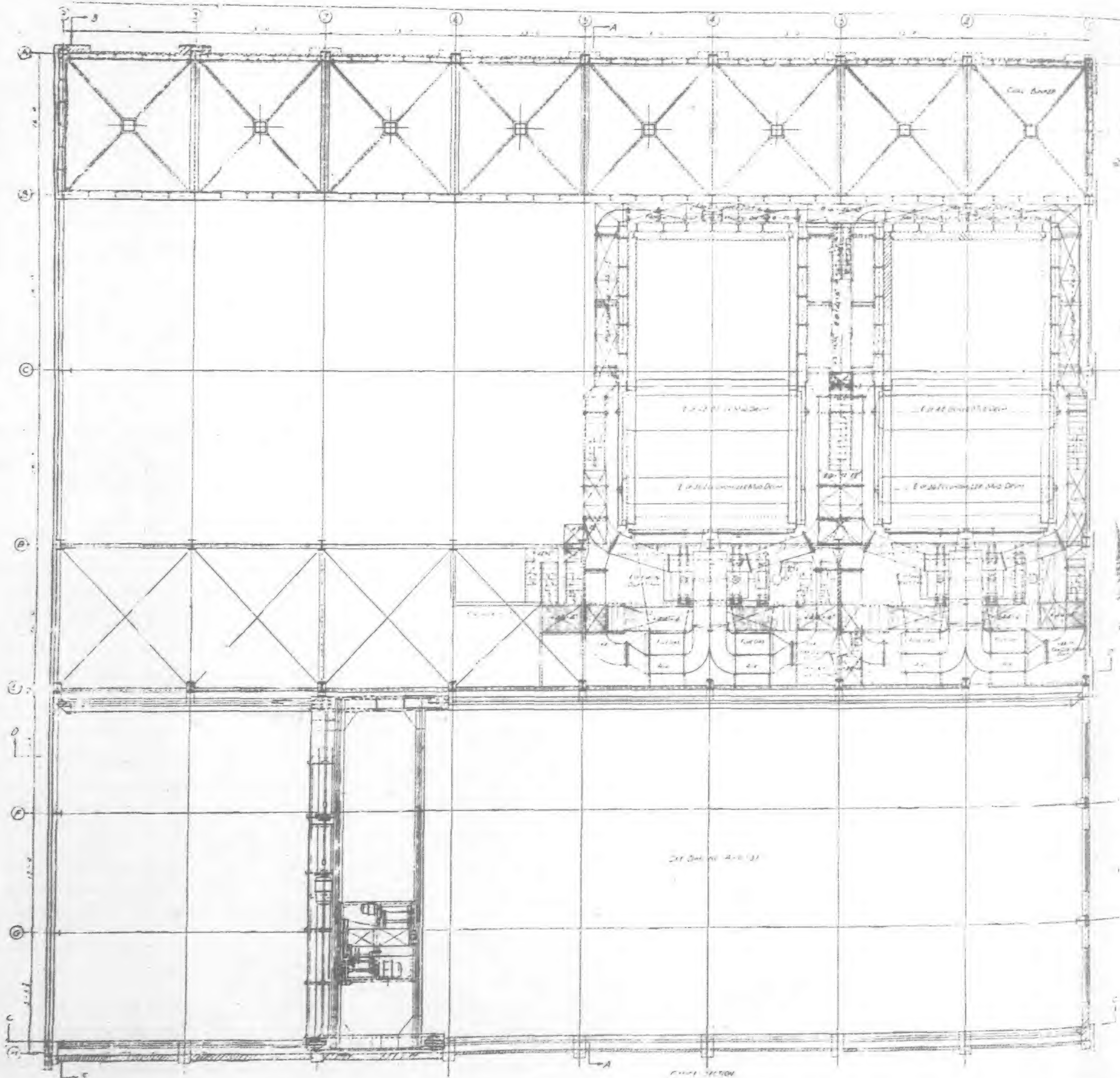


Plate No. 9.—General arrangement, Transverse section Hangchow Power Plant. Scale ¼-in. to 1-ft. Hollis H. Arnold, Consulting Engineer

The cost of the plant, including land, land development, railway sidings, buildings, equipment and spare parts for two years' service, tie lines and transformer station, including commercial and engineering expenses and interest to date of starting plant, was approximately M.\$4,000,000, of which amount M.\$500,000 represents interest and approximately M.\$250,000 tie lines and transformer stations.

The designing work began in October, 1929, and the pile driving work was started in June, 1930, and structural steel erection was started in December, 1930. Construction work was delayed for the completion of the dykes and bund and ordering of equipment was delayed by change of control, which resulted in the plant being completed approximately one year later than originally scheduled. These delays increased the cost of the plant approximately 10 per cent.

The actual cost of the plant, excluding tie lines and transformer stations and interest, is approximately M.\$3,200,000, equivalent to M.\$200 per kilowatt—now about G.\$42. This cost per kilowatt may be compared with plants of similar capacity and efficiency completed in the United States of America during the past two years at a cost of from G.\$75 to G.\$85 per kilowatt and in Europe from G.\$60 to G.\$75 per kilowatt of capacity.

The plant equipment was purchased under twenty separate purchase contracts and approximately one-hundred-and-twenty additional purchase orders. For the building and masonry structures there were four separate contracts—piling, structural steel, general building, and painting.

For the installation of plant equipment the Hangchow Electricity Works' employees were utilized, however, separate contracts were placed for such items as tube expanding, boiler brickwork, insulation, and welding and other fabrication of steel. Equipment

manufactured or fabricated in China, including building and bunker steel supports, platforms, ladders, ducts, casings, breechings, chimneys, tanks, etc. and also all cast iron piping, gate valves, ash-gates, operating mechanism and miscellaneous parts, weighed approximately 1,100 long tons and the weight of imported equipment was quite close to this amount. Equipment fabricated or manufactured locally to detailed drawings and specification and thorough inspection and testing is considered equal to the imported equipment in quality for the respective purposes for which it was utilized.

For the specifications for purchase-contracts and orders and for construction, over 1,000 pages of specifications and 1,000 drawings were supplied by the designing engineer. The employment of local fabrication and manufacture and the sub-division of equipment into the number of purchase-contracts and purchase-orders aforementioned are estimated, by the designing-engineer, to have affected a saving of approximately M.\$750,000, after taking into consideration the quality of equipment and workmanship obtained.

Mr. A. C. Chen was employed as construction superintendent for all structural work, and under the terms of the purchase-contract for boiler equipment and the purchase-contract for turbine equipment erecting engineers were provided to supervise the assembly, adjustment and initial operation of equipment.

Dr. Ernest Hsieh functioned as structural designing engineer for foundations, buildings and masonry structure.

Mr. Poy G. Lee functioned as consulting-architect.

The Metropolitan Construction Co. were the general building contractors.

This plant was put into operation in October of this year and it is expected that the performance tests will be carried out during December.

China and the Engineer

THE engineering work accomplished by the International Famine Relief Commission is an admirable example of quiet and successful co-operation between the Chinese people and highly qualified specialists from Western countries. The great floods of the Yangtze Valley last year brought home the need for extensive conservancy schemes in China, but it is not always realized that admirable work is going on, under the supervision of the Commission's engineers in eleven provinces of China. The engineering department of the Relief Commission was organized in 1923 "for the purpose of uniting engineering work that had formerly been done by Provincial Committees." Its first big job was a flood relief project in Shantung, when some two hundred square miles of land, devastated by the Yellow River leaving its banks, were reclaimed and some 250,000 people were able to return to their homes. Other valuable conservancy work was done in the Yellow River area and a number of roads were built in various parts of China.

The last three years, following the severe famines of 1929-1930 in the north-western provinces have been of particular fruitfulness, and the report of the Commission's chief engineer, Major O. J. Todd tells a remarkable story of work that will prove of permanent value to the Chinese people in their struggle against alternate droughts, and the terrific forces unloosed when their rivers are in flood.

Perhaps the two outstanding achievements have been the Saratsi Irrigation Project in Suiyuan described fully in the August number of *The Far Eastern Review*, and the Wei Pei Project in Shensi, forty miles north of Sian. The annual rainfall in Suiyuan averages only twelve inches and in 1929, a fall of less than seven inches caused serious famine. A main canal was cut from the Yellow River to a tributary, the Black River, a distance of forty-five miles. A triangular area of about 250,000 acres was thus enclosed, and from the canal fourteen straight "lateral canals," three miles apart from each other, were dug, joining the main canal with the Yellow River. The farmers in the area have been left

to tap the lateral waterways, a process which they have not been slow to start. The present population is 50,000, but a rapid increase is expected and no doubt "the desert will blossom like the rose," after a few years of intensive cultivation by hard-working peasants of North China.

At its intake the main canal had a surface width of 90 feet, a width of 60 feet on the bed, and a depth of 10 feet. The lateral canals have a surface width of 40 feet. The project cost \$750,000 of which the Provincial Government found \$300,000, and is repaying the remainder, which the Commission advanced, by means of water rates. The local authorities also made a loan of 3,600 soldiers, and the enthusiasm with which the soldiers and the local population threw themselves into the work was not the least satisfactory feature of this achievement.

The Wei Pei Irrigation Project meant the irrigation of 90,000 acres of good farm land. The scheme was a difficult one, and attempts to irrigate this piece of land have been made, without success, during the past two thousand years. This triumph of modern engineering involved an elaborate diversion dam, intake tunnel and channel, bridges and culverts, the cost totalling about a million dollars.

Roads and irrigation works, the Commission has found, are the great needs of China. Where these exist famine loses much of its terrors, and wealth accumulates under the natural industry and thriftiness of the population. The chief engineer's report is insistent upon the helpfulness of both authorities and inhabitants. They are fully alive to the benefits of this help, which does not, as in the case of the railways, bring in its train a concentration of militarist activity. It is along these lines that China's problems will probably settle themselves. As prosperous communities replace famine areas, peace will gain the upper hand, and a system of Government will emerge, capable of maintaining order, of destroying militarism and of enabling ordinary citizens to pursue their avocations of agriculture, industry and commerce, under conditions adjusted to national ideals and characteristics.—*Hongkong Weekly Press*.

The Electrification of Indo-China

By RENE THERY

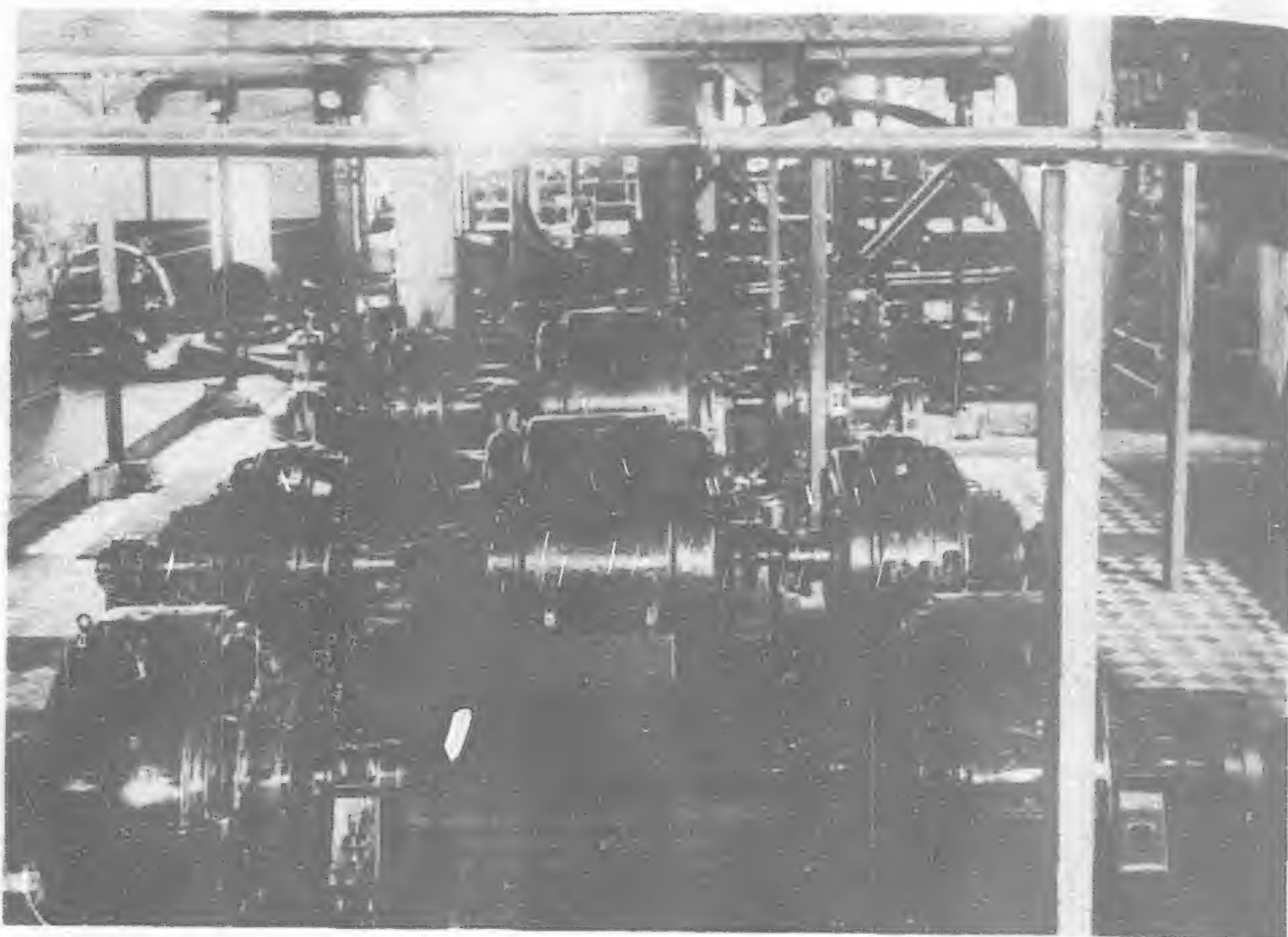
(Translated by A. J. DA COSTA)

IN a former article the author undertook to outline the successive stages of the task of furnishing electrical power to Indo-China, and to sketch an exact picture of the state of development, already very satisfactory, to which it had reached five years ago. Recalling that the first thermal station was inaugurated in the Colony only in 1894, on December 31, 1926, more than 75 per cent of the parishes of Cochin-China, Tonkin and Annam, in which there are at least twenty-five Europeans, were supplied with electricity for lighting and ventilation, as well as for the supply of water. All the industries of importance were adequately supplied as to electrical energy; and the outfit thus constituted utilized a total power of sixty thousand to sixty-five thousand horse-power, of which about thirty thousand were consumed in Cochin-China, twenty thousand in Tonkin, and fifteen thousand in Cambodia, Annam and the Laos states, locking up capital to the extent of two hundred million francs.

Since that time, the efforts undertaken for perfecting the electrification of the country were pursued with method and vigor. The universal economic crisis and the resulting difficulties in the finances of the Colony did not check them in the least. At this very moment, new programs of extension are being carried out.

This addition, therefore, to earlier reports will not be out of place. It will, moreover, prove how fruitful can be the co-operation of the Administration with private enterprises when the same sentiment of common weal activates them both, and when both in their respective spheres bring to the accomplishment of their task a maximum of activity and competence.

Between 1927 and the present date, agreements were contracted between various electricity companies, to render their exploitation more homogeneous and less onerous by an appropriate interconnection of their systems, and a more judicious specialization of their generators. At the same time a great number of power stations have been modernized—sometimes completely remodelled



Old Plant in Heart of Hanoi now being used as a Substation. In background is one of the Old Horizontal "Farcot" Engines

—and considerably strengthened. The local distribution lines have been much improved and extended and, finally, the construction of a very dense network of lines transporting force and light have been begun over the whole of the Tonkinese Delta, and conversations have commenced for the purpose of instituting a similar expansion in the Mekong Delta.

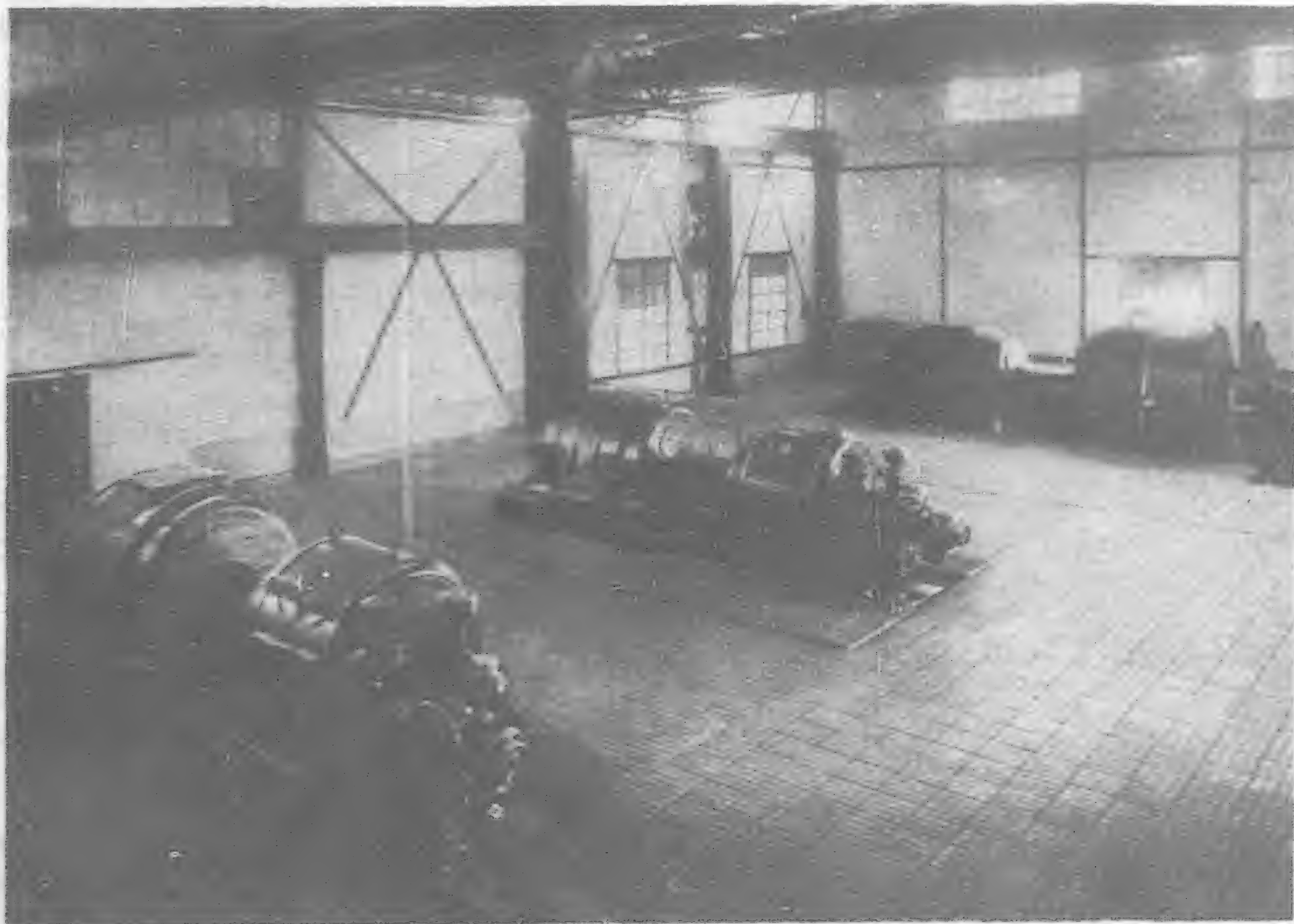
To-day, the electricity of Cochin-China is supplied by four firms: "L'Energie Electrique Indochinoise," "La Compagnie des Eaux et d'Electricité de l'Indochine," "La Société Coloniale d'Eclairage et d'Electricité" and "L'Union Electrique d'Indochine."

The first utilizes at Cholon a thermal plant which is by far the most important in the entire Colony, with an installed power of more than 32,000 h.p., furnishing by means of turbo-alternator units of the latest model a three-phase current of 6,600-volts. The company is concerned exclusively with the supply of power, imparting electrical energy to the tramways, the wireless telegraphy and the "Compagnie des Eaux et d'Electricité."

This latter is titular to the concessions of Saigon, Cholon, Gia-Dinh, Laithien, Thuduc, Bien-Hoa and Thudaumot. It possesses at Saigon a generator of 6,250 h.p. worked by vapor, giving a three-phase current of 6,600-volts, and receives an appreciable supplement from "L'Energie Electrique Indochinoise." At Saigon and Cholon, subterranean cables transmit electrical energy to transforming stations, of which several, for a certain section of Saigon, convert alternating into direct current. From Saigon, aerial lines of a total length of nearly one hundred kilometers, transport energy at a tension of 6,600-volts to other centers.

The "Société Coloniale d'Eclairage et d'Energie" distributes electricity to Vinh-Long, Sadec and Tra-Vinh by means of independent Diesel generating plants, developing together more than 1,000 h.p. It has at Cantho a generator—also of Diesel engines—of more than 2,000 h.p. producing a 6,600-volt three-phase current, which, raised to 30,000-volts, is transmitted to the southwestern part of the Cochin-Chinese Delta: to Sockang, Ba-Lieu, Long-Xuyen and Chaudoc, by a model network of about 300 kilometers, the first of its kind in the territory.

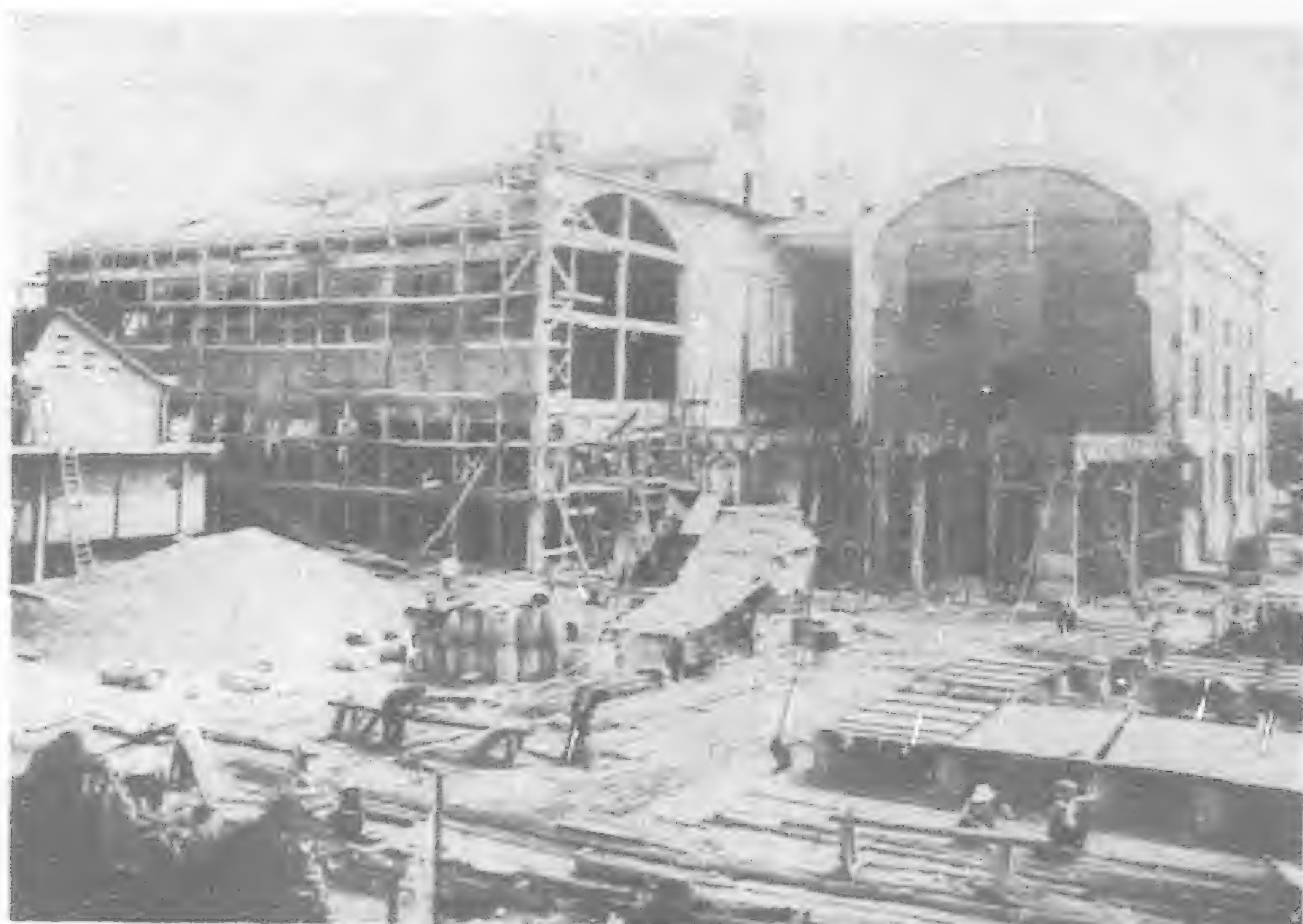
As to the "Union Electrique d'Indochine," its independent generators, worked either by gas or Diesel engines, and of a total power of 1,000 h.p., supply light and force to Cap Saint-Jacques, Mytho and Benké. Finally, a private



Central Electric Plant in Haiphong showing Dynamo Groups, one of 1,200 kw. and one of 3,100 kw.



Central Electric Plant in Haiphong. The work of enlarging the Generating Plant has been completed



Central Electric Plant of Hanoi with work of enlarging Engine Room in progress

concessionnaire supplies current to Rachgia by means of a little local plant.

In Cambodia, the principal installation is that of Pnom-Penh, belonging to the "Compagnie des Eaux et Electricité d'Indochine" which has erected a Diesel-engine power station of more than 3,000 h.p., producing a current of 4,400-volts, distributed by means of subterranean cables and transformers. The centers of Kampot, Sien-Reap, Angkor, Battambang and Kraie are each supplied by an independent generator worked either by gas or Diesel engines belonging to the "Union Electrique d'Indochine." Bokor is supplied by a plant created and exploited by its own Administration.



Coal Yard of Hanoi Central Electric Plant

In Annam, the "Compagnie des Eaux et Electricité d'Indochine" operates the 500 h.p. Diesel engine power station of Dalat, and furnishes a three-phase current of 3,000-volts. The "Société Indochinoise pour les Eaux et l'Electricité en Annam" is the concessionnaire for Nha-Trang, Qui-Nhon, Faifoo, Tourane, Hué, Quang-Tri, Samson, Dong-Hoi and Tanh-Hoa, each locality possessing an independent gas or Diesel engine generator. Its most important plants are those at Tourane and Hué, of 350 and 750 h.p. respectively. The "Union Electrique d'Indochine," by means of an independent

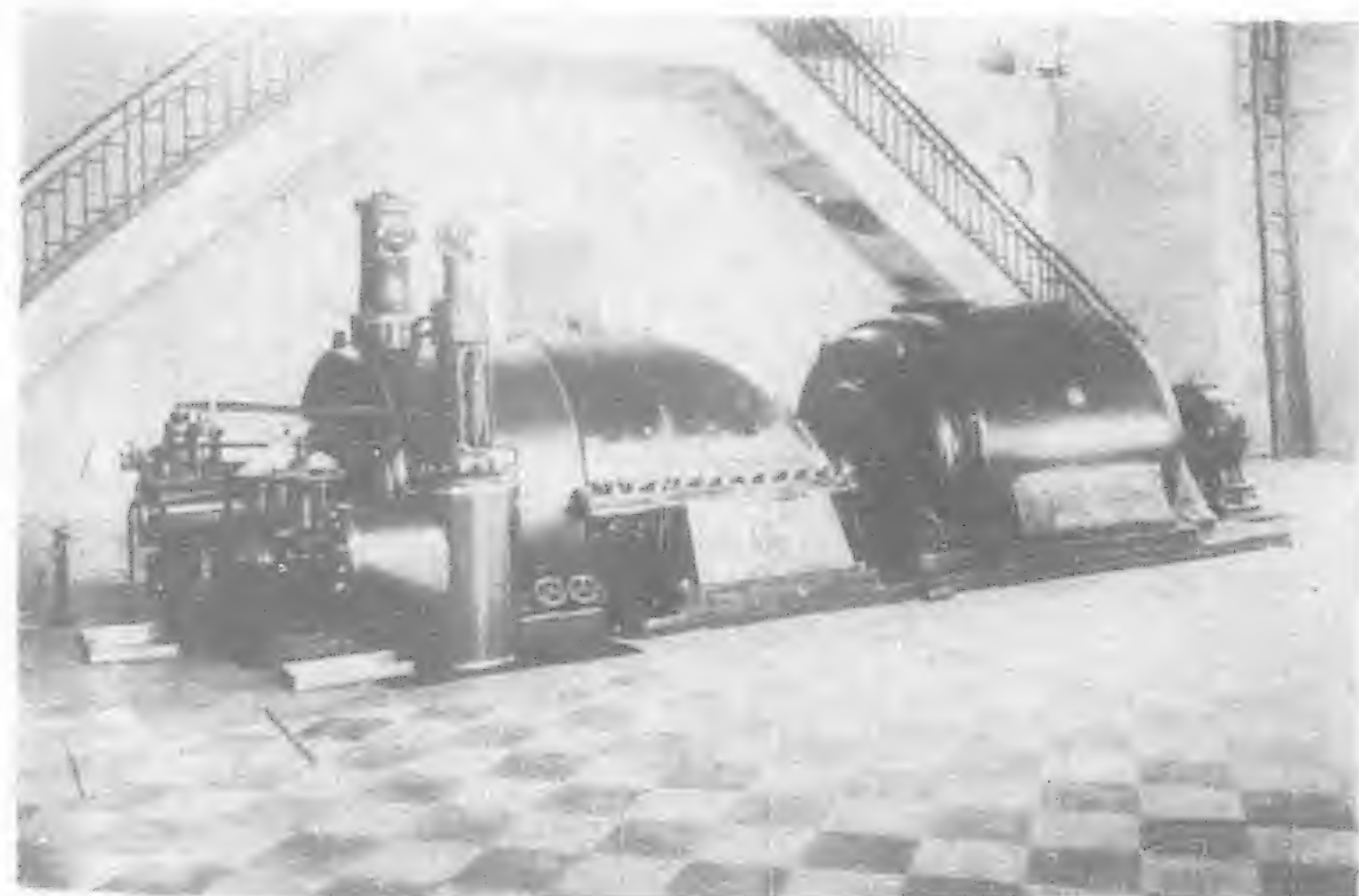
generator supplies current to Phan-Thiet. Private concessionnaires exploit Vinh-Bentuy (where the "Société Forestière et des Allumettes" own a 2,250 h.p. plant) and Cua-Lo, and the distribution at Ben-Methust is looked after by the Administration.

The Laos is provided with a plant belonging to private concessionnaire at Luang-Prabang, and with another built and exploited by the Administration at Vientiane.

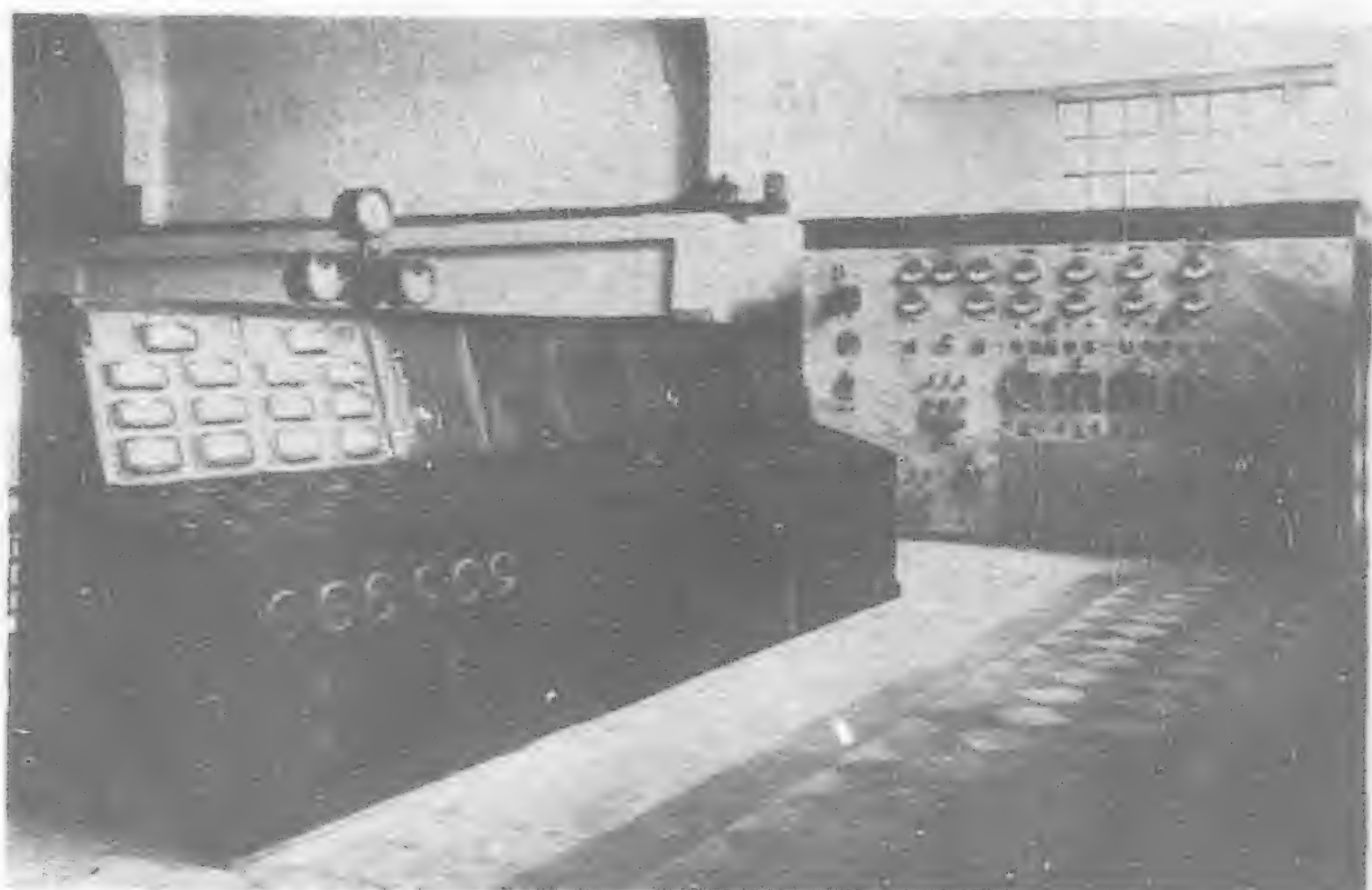
In Tonkin, the most important electricity organization is the "Société Indochinoise d'Electricité," concessionnaire of the towns of Hanoi, Haiphong and Nam-Dinh and of the centers Ha-Dong, Doson and Kienam. Very recently, this concern has inaugurated a power station at Hanoi provided with two groups of turbo-alternators of 4,600 h.p. each, supplying a three-phase current of 6,600-volts, transformed at present into direct current for local distribution by underground cables and sent by aerial lines at 5,000-volts to Doson

and Kienam. Nam-Dinh is fed by a power-plant comprising four gas units of 250 h.p. each, furnishing a current of 6,600-volts.

On the other hand, private concessionnaires supply electrical energy, by means of independent generators, to Bac-Ninh, Dap-Cau, Lang-San and Tuyen-Quang, and installations belonging to the



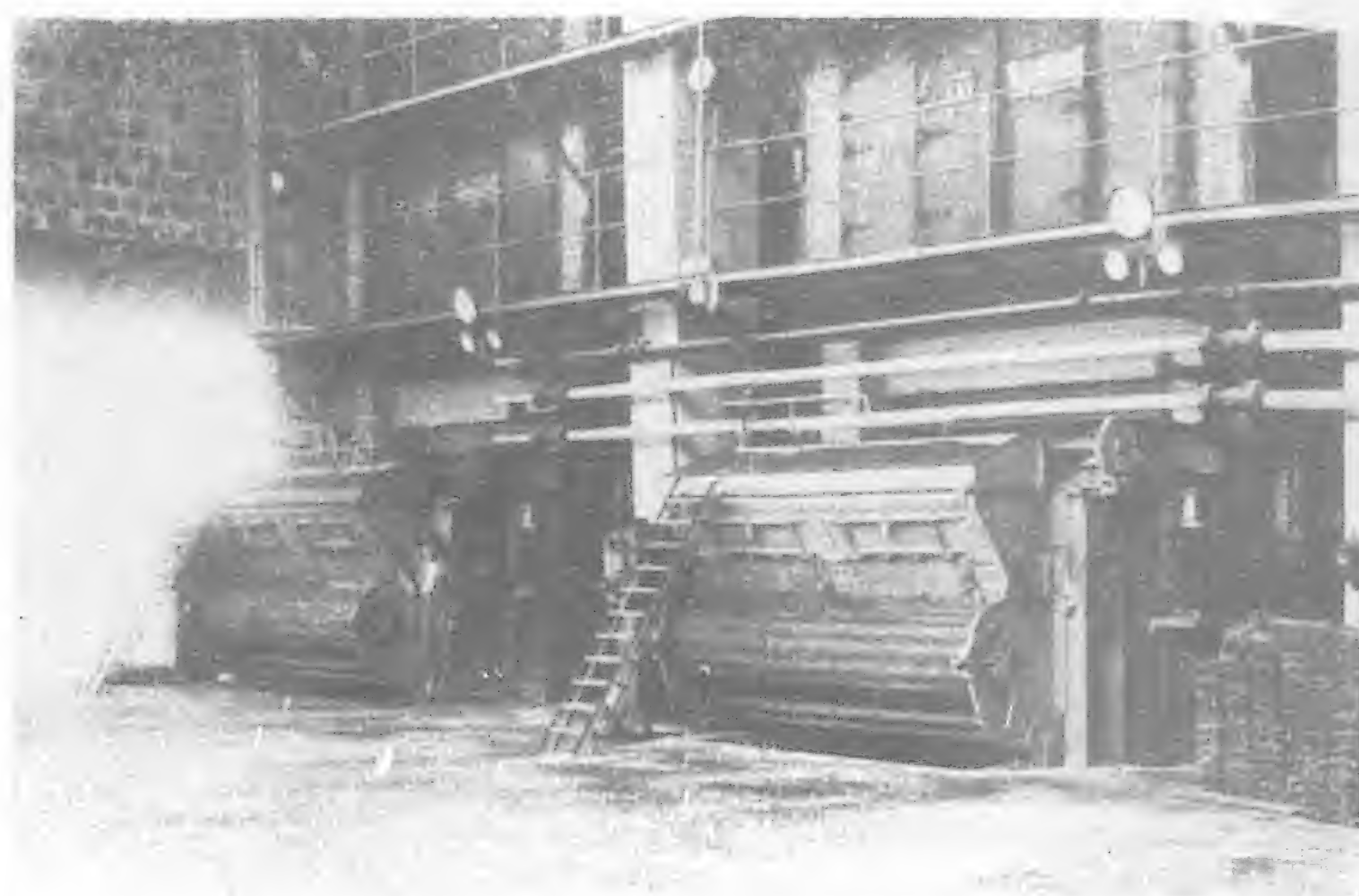
One of the Turbines of 3,750 kw. in Central Electric Plant of Hanoi



Part of the Switch-board Room of Central Electric Plant, Hanoi



Exterior of Central Electric Plant, Hanoi



First two "Babcock and Wilcox Boilers" are being installed at Central Electric Plant, Hanoi, showing Automatic Coal Distribution

Administration are in service at Chapa, Lao-Kay, Yen-Bay, Son-Tay, Phu-Lang, Thuong, Tam-Dao, Haiduong and Quang-Yen.

Moreover, several important industries have constructed powerful generating stations to satisfy their own needs. The "Société Française des Charbonnages du Tonkin" possesses near Hongay a thermal station of 5,000 h.p. feeding the labourers' agglomerations of Hongay and Campha and supplying electrical energy for traction to its industrial railway of about thirty kilometers in length. The Société des Charbonnages du Dong-Trien owns a similar power station of 2,750 h.p. which supplies power to Hong-Bi. The "Société des Anthracites du Tonkin" has one of 875 h.p. The "Société des Ciments de l'Indochine" has installed at Haiphong a generating unit of 7,500 h.p. The "Société Cotonnière du Tonkin" has built one of 1,000 h.p. in the same town and one of 2,500 h.p. at Nam-Dinh.

Finally, in the territory of Kouang-Tcheou-Wan, the "Société Indochinoise d'Electricité" owns a Diesel engine power plant of 500 h.p. at Fort-Bayard, which produces a three-phase alternating current at 6,600-volts, which is distributed not only to Fort-Bayard, but also, by means of a high-tension line of twelve kilometers, to the center of Tche-Kam.

Hence, the installations actually working produce all together nearly 95,000 h.p.—45,000 in Cochin-China, 35,000 in Tonkin and 15,000 distributed over the rest of the territory—furnished by fifty-six power stations, and these comprise four systems of underground cables—at Saigon, Pnom-Penh, Hanoi and Haiphong—a high-tension overhead system of 300 kilometers and another of 100 kilometers in Cochin-China, three high-tension lines in Tonkin and a similar one at Kouang-Tcheou-Wan. The total sum invested in these works amounts to more than three hundred million francs.

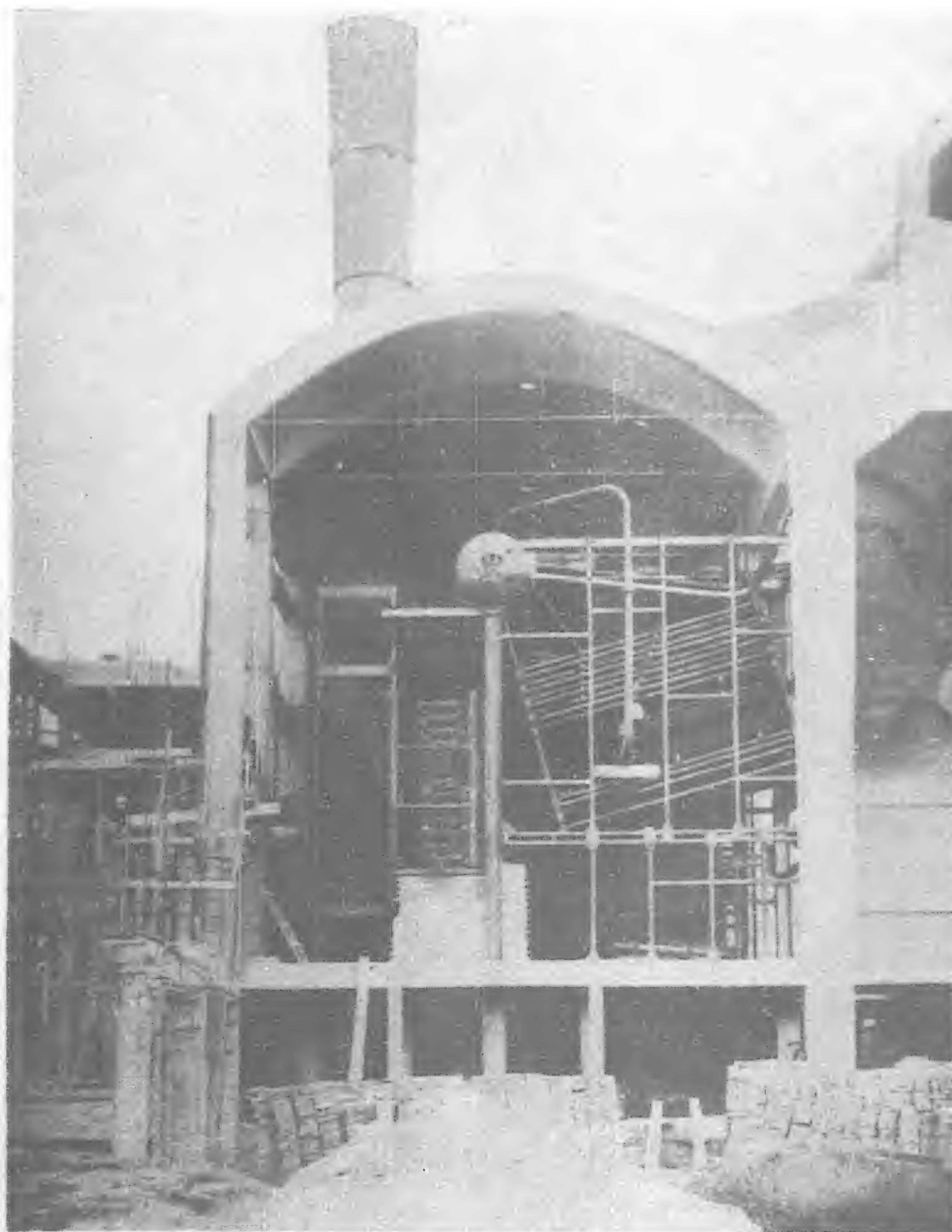
Other extensions, more important still, will be realized in the near future. First of all, a contract to electrify the whole of the Tonkinese delta was signed in 1931 by the Government-General of Indo-China and the

"Société Indochinoise d'Electricité," and approved by the Minister for the Colonies.

By this contract, the "Société Indochinoise d'Electricité" undertakes: firstly, to increase gradually the generating power of its plant at Hanoi to 50,000 h.p.; secondly, to augment the output of its station at Haiphong proportionately to the needs of the town; thirdly, to replace, in the same town, direct current distribution by alternating current distribution; fourthly, to establish over the entire delta an electrical system at very high tension (30,000 and 45,000-volts) covering 700 kilometers, interconnecting the power stations of Hanoi, Haiphong and Nam-Dinh respectively, reaching all the centers of the region which have already been electrified, bringing power and light to all the centers which have not yet received them, and permitting the multiplication of the pumping posts by means of which the irrigation will be developed and the desiccation of the marshy regions effected. This program, of which the economic utility is obvious, is proceeding apace.

Conversations, having in view undertakings on the same lines and on a like scale in Cochin-China, and Lower Cambodia, are being held between the Administration and the "Compagnie des Eaux et d'Electricité d'Indo-Chine." If they are successful, as there is every reason to hope, a dense and perfectly laid-out system will soon also cover the whole Delta of the Mekong and the surrounding regions. Plans for the extension of the electrification of the most populous districts of Annam are being studied.

Finally, the possibility of utilizing several waterfalls for producing hydro-electrical energy is being examined. The most important waterfall of Danin, in the Langbian, has already been the object of a petition for a concession from the "Société des Grands Travaux de Marseille." However, the scheme for the production of Hydro-electrical energy will have to face great practical difficulties due to the distance of the sources of production from the centers of consumption. Besides, the needs of Annam



One of the "Babcock and Wilcox" Boilers being installed

do not seem at this moment to be very urgent. On the other hand, the execution of the plans concerning Tonkin and Cochin-China will most likely be completed in a few years. The electrical energy placed at the disposal of the territory will then be well over 100,000 h.p., with the possibility of being rapidly raised to 150,000 h.p. Two perfected systems of distribution at very high tension will be in service, on a length of nearly two thousand kilometers and an electrical outfit satisfying all the agricultural, industrial, hygienic and, if needs be, railway requirements, will be constituted in the two richest states of the Union, in the development of which it will be a prominent factor.

It will be noted that in the progressive carrying out of these programs, there exists the same spirit of method, equilibrium and intelligent recourse to the latest scientific and economic precepts that marked earlier developments.

The results obtained are all the more to be admired because the obstacles which had to be overcome were numerous and constant, as was observed by Monsieur Ernest Teissier du Cros, Engineer of State Manufactures, who pointed out that all electrical ventures in the Colony are heavily handicapped. All the apparatus and materials, (even fire clay and bricks), have to be imported at great expense, the cost of upkeep of the materials and apparatus, not only on account of the high cost of spare parts, which have to be imported, but also on account of the climate, is abnormally high: technical problems, peculiar to the region on account of the extraordinary exuberance of the vegetation and the impossibility of employing the usual insulating materials, and for many other reasons, have to be solved. Finally, a large proportion of highly paid Europeans have to be included in the staff, which involves huge expenses for salaries.

In spite of these handicaps, the work is progressing rapidly. A just appreciation of the extent and the nature of the co-operation between the public powers and private enterprises may be gauged from the following points of the 1931 agreement concluded between the Government-General of the Colony and the "Société Indochinoise d'Electricité":—the Government participates in the first expenses of the systems of general electrification by paying to the concessionnaire annuities which decrease as the receipts increase, and, in compensation, receives a certain percentage of the said receipts, the balance being maintained in such wise that the company's expenses for the production of energy, exploitation and upkeep, as well as interest and amortization of the capital realized, are well covered. It is, in fact, a veritable coalition between the Government and the "Société Indochinoise d'Electricité," all the more effective because the Government-General has subscribed to 15,000 new shares of the firm, which had been reserved for it since the last increase of capital, and because it is represented at the company's council.

This formula has proved perfectly efficacious. Faced with financial difficulties, with which every one is cognisant, the Government-General would have been utterly powerless to carry on the work if it had operated alone. The vastness of the work, on the other hand, would have exceeded the capacities of concessionnaires if they had to shoulder all the expenses alone. Thanks to the system outlined, the credit and the competence of the Society, strengthened by the guaranty of the Administration, which has to bear only the moderate weight of the annuities, insure the successful issue of the plans.

All the parties interested are satisfied. Since the group "Eaux et Electricité, Energie Electrique et Indochinoise d'Electricité" was constituted, it has acquired an extremely solid position, which the universal depression has practically not affected, and its future prospects are very rosy indeed. Its efforts have bestowed on the country an outfit admirably suited to its needs, and tend to perfect day by day the installations for the common welfare.

China's Printing Industry

By Trade Commissioner JOHN J. EHRHARDT, Shanghai

THE Chinese demand for books, magazines, newspapers, catalogues, and other printed matter is increasing year by year, and this greater consumption, which is accompanied by a demand for better quality and for more variety in printing, is also reacting favorably on the market for imported printing ma-

chinery. Imports of printing machinery into China during the 5-year period 1925 to 1929, inclusive, averaged somewhat more than \$500,000 in value annually, the peak—\$846,000—occurring in 1929. In 1930 the value declined to \$514,000, for which the adverse silver exchange, which rendered the price of imported machinery considerably higher, when quoted in local currency, was largely responsible.

Imports of printing machinery from the United States have shown a steady increase during this period—from slightly less than 50 per cent in the total imports in the earlier years to approximately 70 per cent in 1930. Japan ranks second, and Germany and the United Kingdom third and fourth, respectively, as sources of supply for this class of machinery. Figures for the year 1931 are not yet available, but preliminary estimates based on imports through the port of Shanghai indicate that there was a considerable decrease in such receipts. More than 80 per cent of the imports, in fact, are recorded as entered through the port of Shanghai. Those during the years 1929 and 1930 were valued at \$726,953 and \$458,703, respectively, while during the first months of 1931 they were valued at only \$169,967, which would indicate an importation valued at only \$226,600 for the entire year, provided the average of the first nine months of the year is maintained.

The expansion of the printing business in Shanghai is considerably greater than indicated by the imports of printing machinery, inasmuch as domestic production of printing machinery has been expanding very rapidly during recent years. Many of the local printing shops are not in position to pay the high prices demanded for imported machinery and have to be satisfied with the poorer quality of equipment manufactured here. Most of the newspapers, periodicals, and textbooks turned out here have been printed on locally manufactured presses. The quality of printing of these publications, of course, is very inferior, but the paper and inks used are also of the cheapest kind procurable. A notable improvement in the quality of the printing matter turned out by the larger establishments—both Chinese and foreign owned—however, has been noticeable from year to year. These plants find the locally manufactured machinery not suitable for high-quality work, and in general less than 20 per cent of the equipment employed by them is of domestic manufacture. One of the larger Chinese printing houses, with a plant and equipment valued at approximately \$3,705,000, employs only 15 small machines of domestic manufacture, out of a total of 190 machines. The company in question also manufactures printing machinery of many types, which is sold to small Chinese printing establishments.

American printing presses and composing machines predominate in this market, although German presses also enjoy an excellent reputation. German products, on the other hand, lead among such accessories as binding, folding, type casting, and cutting machinery. Recent imports of large rotary newspaper presses have been from the United States and Germany. Lithographic printing is still very popular in China, on account of its advantages in printing large quantities of Chinese text, but is gradually being supplanted by the offset process. The lithographic presses now employed are practically all of Chinese manufacture. Large numbers of flat-bed cylinder presses, which are copies of the Wharfedale originally manufactured in the United Kingdom, are now built in the local machine shops and are quite popular with the smaller printing establishments.

Such auxiliary equipment as folding, binding, sewing, and stitching machinery is only employed in the larger and more modern plants. The smaller shops perform these operations more cheaply by hand—especially when the number of copies to be turned out is limited. One large plant under foreign management, however, claims that it can save a sum equivalent to 15 girls' wages in operating one folding machine, and at the same time save about 5 per cent of the stock. In the larger number of plants, however, folding is still accomplished by hand and the owners assert that it can be done more cheaply this way. The popularity of labor-saving equipment is increasing, however, and there is undoubtedly an expanding market for up-to-date equipment of all kinds in the larger shops. The value of high-grade imported machinery and accessories is becoming more and more appreciated as the art of printing becomes perfected. The domestic machines can be sold at less than half the price, but printing establishments turning out high-grade work recognize the difference in quality, and when sufficient capital is available they are in the market for the higher priced but superior imported products.



The Heart of Shanghai's Business District showing the Whangpoo River

Shanghai—The Port of China

Remarkable Building Era Continues Despite Adverse Influences and Is Seen Approaching a New High Record

OVER a multitude of adverse circumstances, Shanghai continues to triumph. No other great world center has been so beset in recent years with problems and dangers as have afflicted the great Port of China, and no metropolis has marched forward more doggedly and steadily than the city that sprawls along a bend in the Whangpoo River, twenty-five miles from the sea.

The greatest era of building in the history of China has been unfolding through the past ten years here in the commercial heart of the country. And this has taken place while the interior of the

land has been rent with civil wars and given over to uprisings in which millions have perished; while famine and floods have spread desolation; while railway communications of the country repeatedly have been disrupted, if not paralysed; while bandit armies have annihilated whole populations, and with the value of the silver coinage of the nation at lowest ebb in the face of the greatest depression the world has known in modern times. An attack spread over a large portion of the city by an alien invader in the present year to-day through a vista of short months dims into a fading incident, for even while shells were screaming overhead last January workers



were keeping pace with the tempo of machine-guns and were pouring cement and raising steel.

The record of 1932 is not yet finally written, but it is apparent that the tide of progress in Shanghai again is rising, as it has risen so often in recent years, overcoming temporary set-backs. A true index of a city's growth and progress may be seen in the structures it erects. In this, the most difficult year in the history of Shanghai the city is spending something like Taels 50,000,000 for new building work, according to conservative estimates. It is to be noted that this more than trebles the total outlay five years ago, in 1927 and is almost double the total of the following year, 1928. The cost of new building construction in Shanghai in 1929 ran to the total of Taels 45,000,000; in the following year, 1930, the total reached Taels 70,000,000, the highest in the city's history. Owing to local disturbances last year the outlay for building work, for 1931, dropped to Taels 60,000,000. Some observers believe this record will be equalled this year despite all obstacles.

The conflict in and about Shanghai continued through the first three months of this year and necessarily its effects are reflected in the record of building permits issued in the first quarter of the year. While this record

is below the total of the corresponding period of the preceding year a distinct gain in the second and third quarters is to be observed. An immense amount of work is going forward in the areas of Chapei, Kiangwan and Woosung where the major destruction of the conflict was wrought. The value of most of these new structures individually is low, but the total, it is realized, will reach a huge sum. In the following details regarding many of the new buildings completed and in course of construction in Shanghai are given.

Joint Savings Society Building

What will be the highest building in Shanghai is under construction at present and when completed will have twenty-two stories. This was designed by Mr. L. E. Hudec for the owners, the Joint Savings Society of Yien Yieh, Kinchong, Continental, China and South Sea Banks. The building is located at the corner of Bubbling Well Road and Park Road facing the Race-course.

The building occupies an area of approximately 3,000 sq. ft. Four hundred wooden piles 190-ft. long were driven under ground for the foundation. Mr. A. Corrit is the engineer and contractor doing the foundation work. For the excavation work in connection with the foundation "Larssen" steel sheet piles supplied by the Vereinigte Stahlwerke A. G., were used for the first time in Shanghai and have given excellent service in the highly complicated task of excavation in this district of the city.

The skyscraper will be completely of steel. The steel is supplied by Messrs. Siemens (China Company who represent the Vereinigte Stahlwerke A.G. (United Steel Corporation). For the first time in Shanghai a new steel is employed known as "Union Structural Steel" a chromium copper steel whose inherent advantages could be summarized as high yield point, high ductility, marked corrosion resistance and satisfactory weldability. The "Union Steel" has a tensile strength of 35½-42 tons per sq. inch or 52

kg. per sq. mm. against the previously used steel of only 37 kg. per sq. mm. After the completion, the Joint Savings Society will occupy the ground floor, the first, and the basement. The Bank hall will be on the ground floor, its offices on the first floor, and huge safe deposit vaults with 6,000 individual boxes in the basement. From the second floor to the 22nd floor inclusive will be private apartments and an apartment hotel. A dining-room will be on the second floor and on the 14th floor a grill room facing a roof garden.

Mr. B. J. Lindskog is the engineer for the building. Mr. A. Corrit is the engineer for the foundation of the building. General building contractors are: Yah Sing Construction Company for the basement and Voh Kee Construction Company for the upper part of the building. The cost of the building is two million taels.

Grosvenor House

The erection has now commenced of the Cathay Land Company's new apartment building which will be known as "Grosvenor House."

This new building is situated between Cathay Mansions and Cathay Theater and is set back a considerable distance from Rue Cardinal Mercier in order that residents shall not be annoyed by street noises or dust. Approach roads will be formed giving access from Rue Cardinal Mercier, Avenue Joffre and Rue Bourgeat. The position of the building on the site permits a large garden to be laid out to the south, which should prove a great attraction to the residents.

The building, which is to be twenty-one stories high, will be fire-resistant throughout and externally will present a modern appearance, but preserving a residential character in harmony with the Cathay Mansions.

The flats on the main floors vary in accommodation and the upper floors are designed as flats-de-luxe

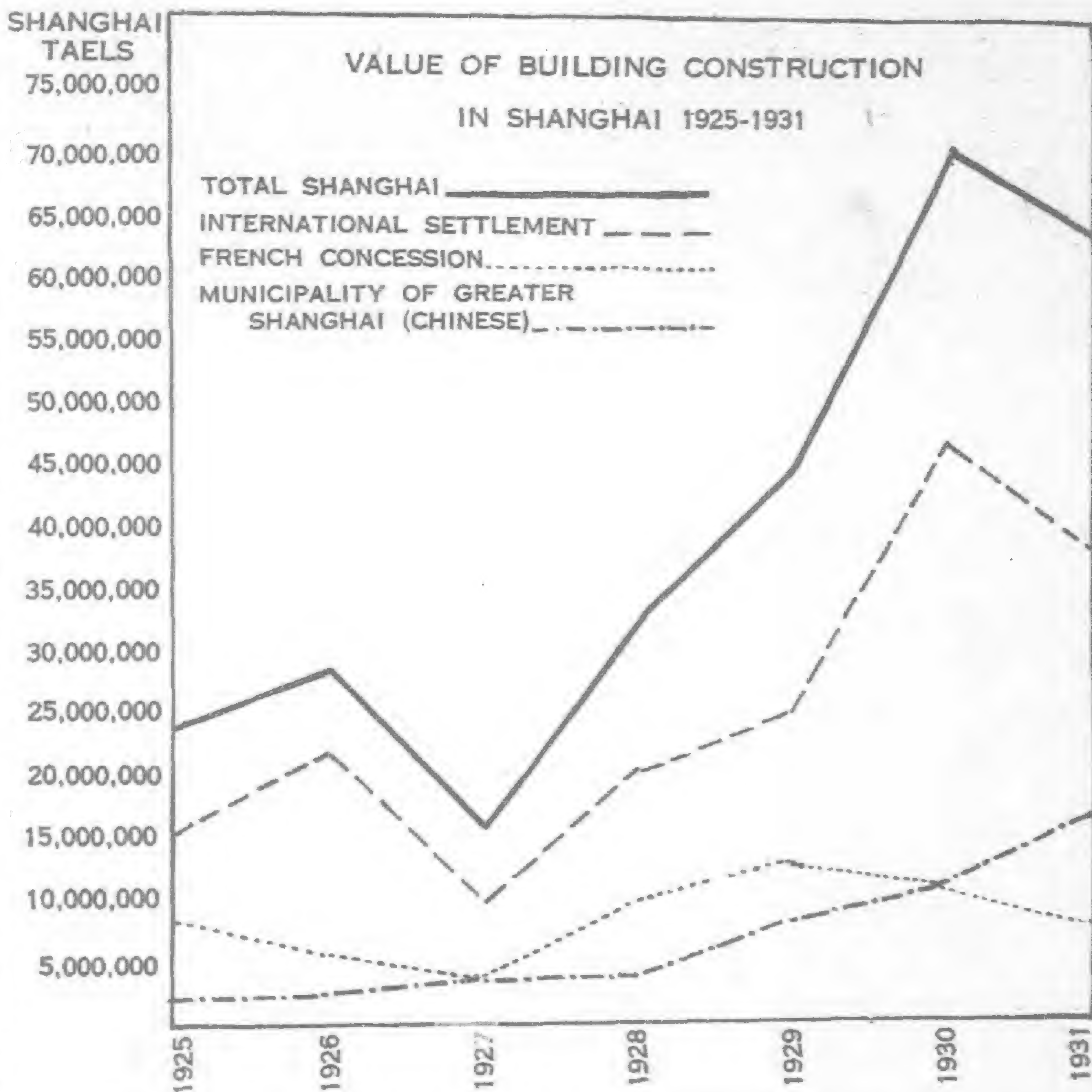
with roof gardens and terraces affording excellent views over the city. All flats will enjoy a southern exposure and through ventilation and will be equipped with the most up-to-date appointments including the installation of radio. It is intended that the finish of these apartments shall be of the highest class and the internal decoration of varying designs of a period character.

A special feature of this building is that corridors have been eliminated in the design and express lifts will deliver the resident direct to his apartment. Accommodation for servants will be provided adjacent to each flat. The whole of the ground floor is to be given up to box rooms for residents, and ample garage accommodation will be provided to the north of the building.

For this building Messrs. Palmer & Turner and Messrs. Algar & Co. are acting as joint architects and it is anticipated that completion will be effected about the spring of 1934.

Embankment Building

This building is the largest in Shanghai containing 6,000,000 cubic feet with a road frontage of approximately 1,400 feet, the



longest front facing south, over the Soochow Creek, with a view of the Whangpoo River in the distance.

A special feature in the design of the building is the large courtyard providing parking space for residents' cars during the day time.

The building is eight stories in height with a tower, the ground floor being designed as shops, the first floor as offices, and the upper six floors as residential apartments, with two special apartments in the tower overlooking Shanghai to all points of the compass.

There are 194 apartments in all, of which 62 consist of living room, two bedrooms, tiled bath-room and kitchen, stores, built in cupboards, etc. and 132 with living room, one bedroom, bath-room, kitchen, etc. as before. The majority have spacious verandahs.

The building is of fireproof construction throughout, centrally heated, and with hot and cold water supply to bath-rooms. The fittings and finish are up-to-date in every respect. Gas is laid on to all kitchens for cooking purposes.

Eight electric passenger lifts and one service lift serve all floors and servants' quarters are provided on each of the upper floors.

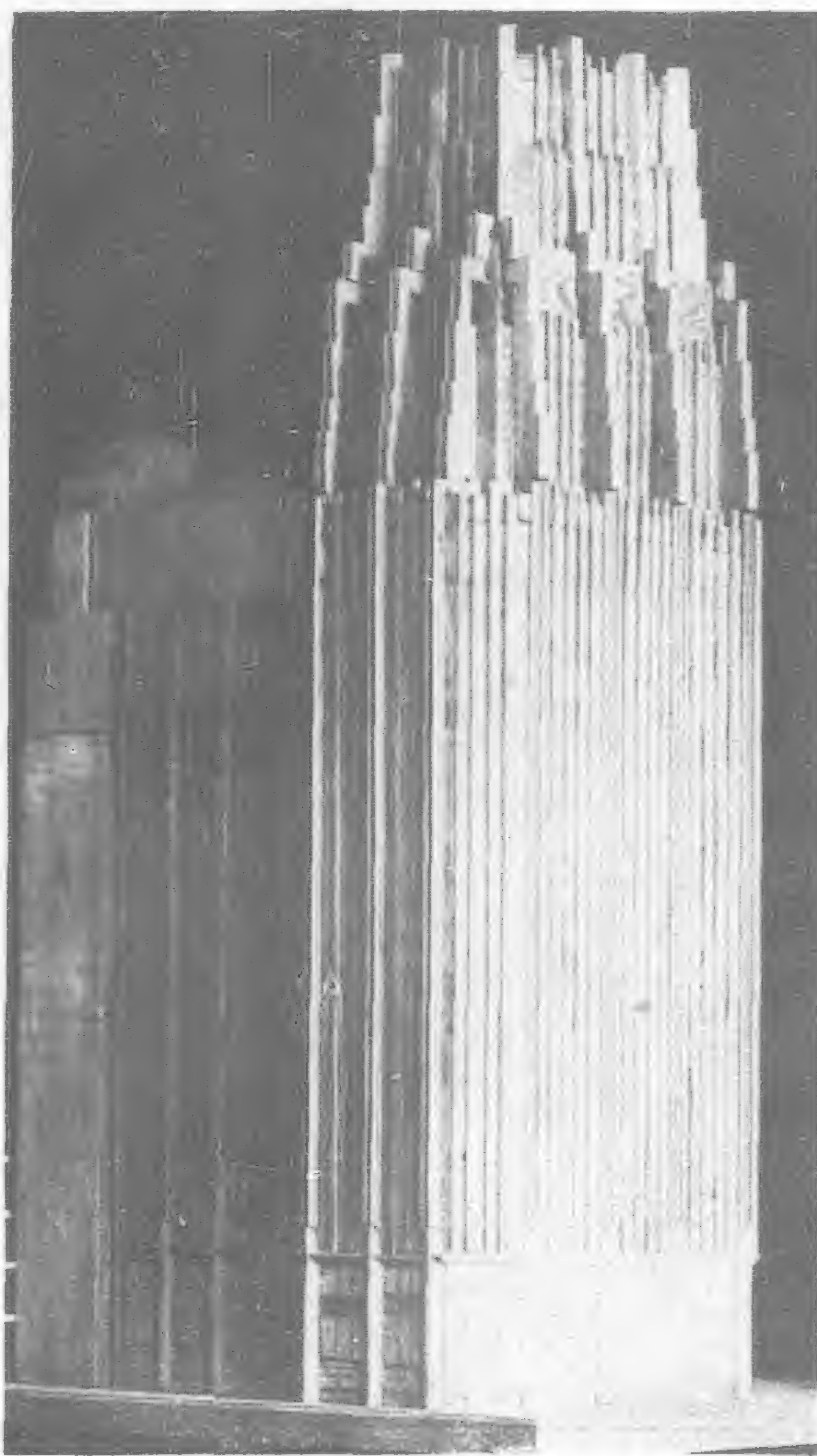
The building has been designed to ensure through ventilation and as it faces on an open space nearly 350 feet wide, is one of the coolest places of residence in Shanghai in summer, although situated within a few minutes of the Central District. This building fulfills a long felt need for up-to-date residential flats at a reasonable rental on the borders of the Central District.

There is a well equipped swimming pool on the ground floor.

Metropole Hotel

A feature of this building is the deep basement which is unusual in Shanghai but common in hotels in other parts of the world.

The building has a basement and fourteen stories above the ground level, in accordance with the building bye-laws the upper stories are set back terminating in a tower. Entrance to the hotel is in the center of the segment at the corner. On the ground floor there is a lounge with manager's and reception office, dining-room, kitchens, etc.; access to the basement is by lifts and staircase — the basement consists of the grill room, bar, barber shop, stores, lavatories, etc., the boiler room and room for the ventilation plant is also situated in the basement. On the first floor there is a large banqueting room with



Architect's Model of New Joint Savings Society Building, Architect, L. E. Hudec

a reception room adjoining and private dining-rooms. The remainder of the floors are given up to bed-rooms, each with its own bath-room, and a few suites. Several of the suites have roof gardens, in fact these are a feature of the building.

The decorations are simple and dignified, suitable for a business man's hotel. The public rooms in the basement and ground floor are supplied with conditioned air cooled in summer and heated in winter. The exterior is faced with granite up to the first floor level then with a special artificial stone finish above. The filling walls and partitions above the ground floor are entirely of "aerocrete" a new substance very much lighter than brickwork or concrete. By the use of this material the cost of the building was much reduced, not only the foundations being lighter but a considerable saving in steel was effected. The building is fire resisting throughout with steel windows, reinforced concrete floors and roof. The upper part of the building is sprinklered as an extra precaution against fire.

The bedrooms are fitted out in the very best manner and each room has not only a bell service, but telephone and radio plug.

The Old English grill and bar in the basement are extremely popular being something new for Shanghai, the design of these rooms is most attractive, the special feature being an enormous fire place with niches for large pewter tankards and in the piers are to be seen halberds as used in processions hundreds of years ago.

It is noteworthy that the whole of the steel framework, 14 stories high, was erected in the record time for Shanghai of three months. Messrs. Sin Jin Kee were general contractors for the work.

Hamilton House Section 1

This building is situated at the corner of Foochow and Kiangse Roads, immediately opposite the "Metropole Hotel." The owners are Messrs. E. D. Sassoon & Co., Ltd. The architects, Messrs. Palmer & Turner. It was ready for occupation on October 1, 1932.

The building is fourteen stories in height at the corner, but in accordance with the building bye-laws, on the road frontages the upper stories are set back forming roof gardens at various levels. Several of the apartments on the upper floors have excellent views of the city and river, and will enjoy breezes from all points of the compass.



Architects Drawing of Grosvenor House, Architects, Palmer and Turner and Algar and Company



The New Embankment House on Soochow Creek, largest Apartment Building in Shanghai

The ground, first, second and third floors consist of light and airy offices. The floors above, with the exception of the sixth, have been designed as high class apartments varying from one to four rooms. They are most attractively arranged, the majority being self-contained, having fully equipped kitchens and pantries, including refrigerators and electric cooking stoves.

The sixth floor is allocated as an Annexe to the Metropole Hotel and consists of furnished bedrooms and two-room suites. The bedrooms are very comfortably furnished and each has a tiled bath-room complete in every respect. Arrangements will be made for kitchen service for breakfast only for those occupying single rooms who require only one meal a day to be served. This service will be run in conjunction with the Metropole Hotel.

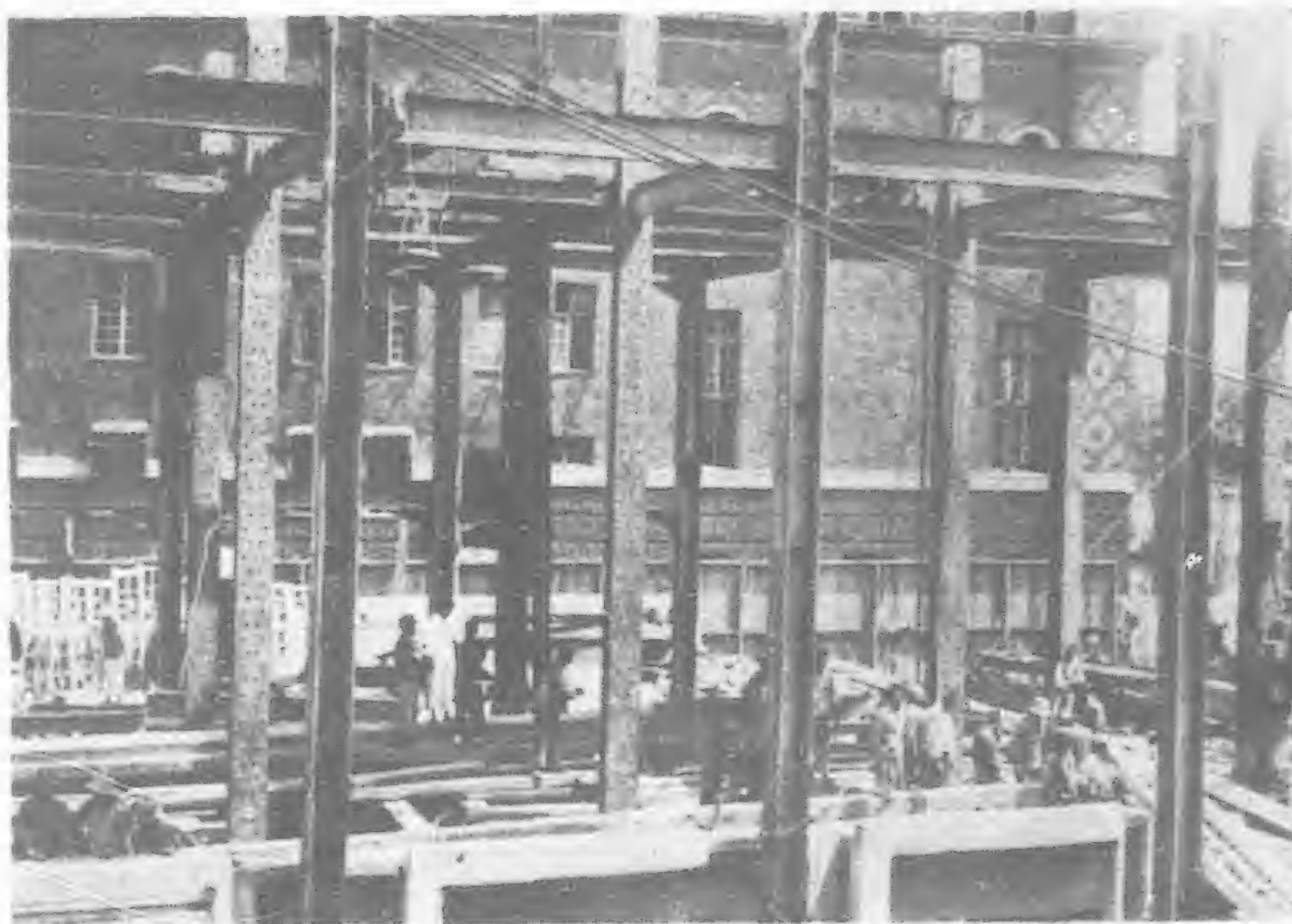
The main entrance to the building is in the center of the segment at the corner, the hall being of a very pleasing and dignified design. The walls are lined with travertine marble and the floor is of marble terrazzo. Three fast lifts give access to all floors. An enquiry desk, with letter boxes for all tenants, is situated in the entrance hall.

The exterior is faced with Soochow granite up to the first floor level and with special artificial stone finish above. The external filling walls and partitions throughout are entirely of aerocrete, a new substance much lighter than brickwork or concrete, but with high insulating

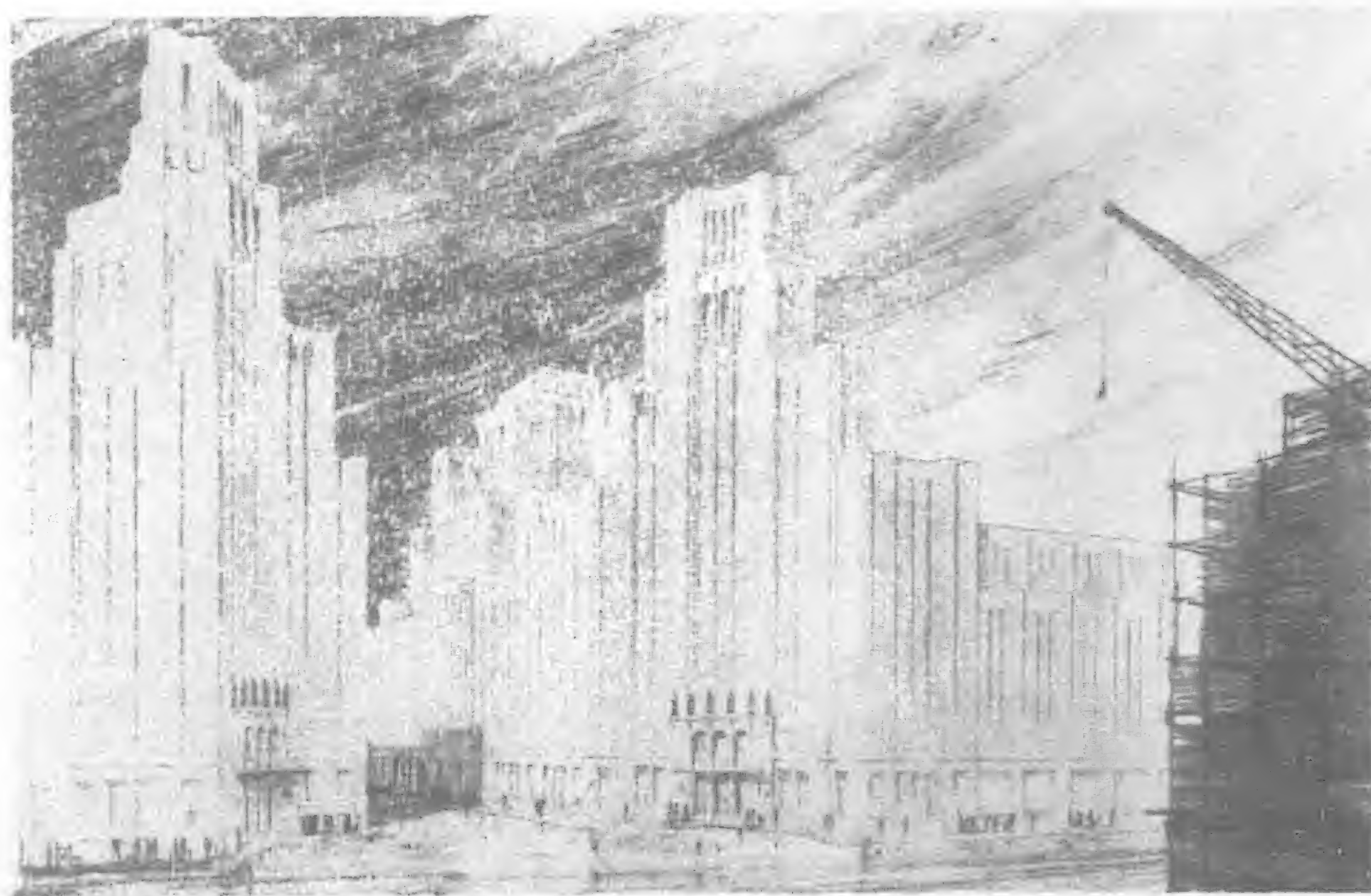
qualities. By the use of this material the cost of the building was considerably reduced, inasmuch as not only were the foundations lighter, but a saving in steel was also effected. The thickness of the partitions is much less than brickwork and they have the advantage of being sound-proof.

The building is fire-resisting throughout and is well provided with emergency exits. The upper floors and tower are sprinklered as an extra precaution against fire. The building is central heated throughout, the boiler room being situated in the basement, hot water is always available.

For those who wish to live in the city itself no more comfortable quarters could be found than this building, situated as it is at a corner which is very quiet at night, and yet near the busy sections of the city, the river, the principal clubs and hotels.



Steel Structure of New Joint Savings Society Building



The Metropole Hotel and the Hamilton House, Architect, Palmer & Turner

Hamilton House Section 2

This building is an extension of Hamilton House proper and, as the corridors will join the two sections, will eventually form one building.

The accommodation provided is similar in all respects to the first section already described, but in addition there will be one de luxe Triplex Apartment at the top of the tower—the most attractive apartment in Shanghai.

This building will be ready for occupation about June 1, 1933.

The Continental Emporium

The remarkable growth of Shanghai during recent years in population and commercial importance has rendered many of the business buildings in the city rather obsolete. It is almost impossible at present for any single establishment of, say, moderate capitalization to secure adequate quarters along Nanking Road, where business might be conducted to the best advantage. The difficulty has a two-fold cause: The obsolescence of the houses both along Nanking Road and elsewhere, and the great heights to which land values in the International Settlement of Shanghai have attained. Land values in the busiest sections of the town have been conservatively estimated at Tls. 500,000 per mow, which shows how difficult it is for business firms who wish to keep a low overhead to obtain suitable locations and yet keep their expenses within bounds.

Furthermore, obsolete buildings are not economical. To the owner, they represent poor investment; to the tenants, they are expensive as far as rent is concerned because they do not utilize space to the most economical extent. Any casual observer will see for himself that many of the houses in the Central District are anything but modern, so much so that they should be termed anachronisms.

It is with a view of alleviating the housing problem in the Central District and of assisting business men in general that the Continental Bank has undertaken to construct a massive building in the heart of the business center. This new structure, was completed in April, 1932, and all space of the huge building is now occupied.

The new building, known as Continental Emporium, has a frontage of 318-ft. along Nanking Road, 222-ft. along Shantung Road, and 285-ft. along Kiukiang Road. The total area it occupies is nine mows. There are six stories, including the ground floor. Shops and showrooms are accommodated on the ground, second and third floors; and the rest will be for offices. A roof garden is found on top, where open-air amusement can be provided.

On account of the fact that this huge building provides space for shops, showrooms, and offices; it is in reality a group of buildings. The difficulty of the architect in designing this building was to meet the regulations of the Public Works Department, the Health Department, the Police Department, and the Fire Department. The walls are much thicker than ordinary, because of the nature of the



The Continental Emporium

building and the possible weight of large numbers of people. A sprinkler system for fire prevention is provided in the building. To co-operate with the police for traffic matters, four entrances were provided, with private roadways in between, both length and cross-wise. To meet the regulation of the Health Department, the building allows much open space for air as well as light. Garbage chutes are installed in the entire building. A special feature of the building is its telephone system. A telephone for every room is provided for and connected with the central telephone room. Connection or change of telephone can be made in any room immediately without any delay of time. Central heating system, mail boxes and other convenient devices are provided for the tenants.

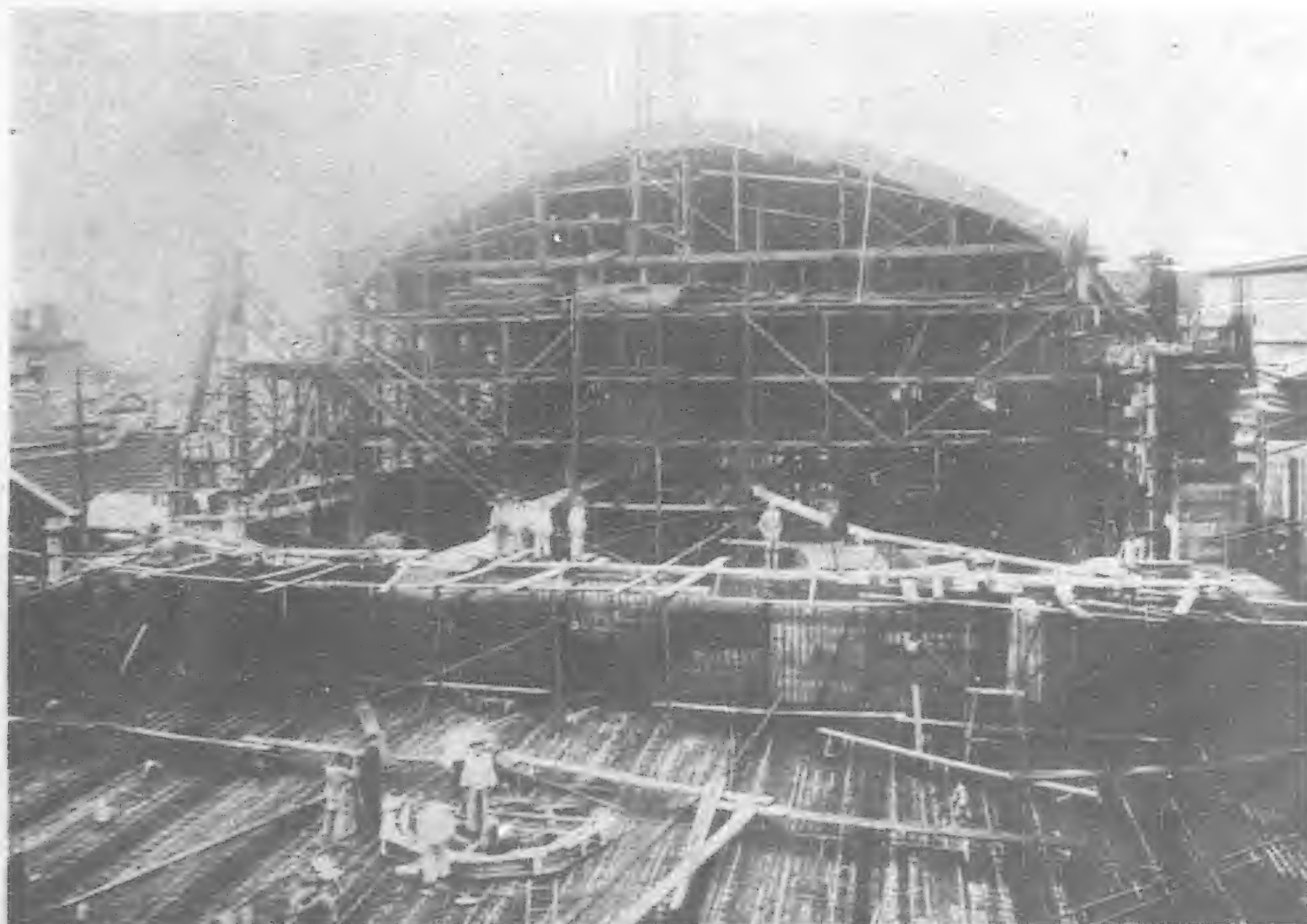
Because of the special features of this building which meet the urgent need of Shanghai business firms, the entire building is at present fully occupied. Another story to be built on the top of the building has been planned by the Continental Bank and designed by Mr. T. Chuang, the architect. Work on the additional story will be started at the end of this year. The building cost was one million taels.

Grand Cinema

Shanghai has probably more theaters than any other city of the Far East. In the past few years many new cinemas have been built in this metropolitan city, such as the Cathay Theater, Nanking Theater, Strand Theater, and Capitol. Shanghai will in the near future have a most up-to-date theater known as Grand Cinema with 2,100 seats. The new Grand will contain besides the cinema, a modern ball room. Many of Shanghai's social functions are expected to take place here.

Simplicity in design marks the new Grand. Almost the whole front part of the building, including the marquee, will be supported largely by glass. Indirect light will be extensively used to give charm to the building.

The entrance lobby will be 50-ft. wide and 200-ft. long in curved shape. For the purpose of eliminating traffic congestion the architect has planned three entrances. The main entrance will be on the Bubbling Well Road and the other entrances on Burkill and Park Roads.



Grand Cinema in course of Construction, Architect, L. E. Hudec

The roof of the new Grand will be a distinctive feature of the entire building. There will be no dome; instead the roof will ascend upwards, shelve by shelve, slab by slab or step by step, like a radiating arrangement of inverted staircases.

Reyer Construction Company is the contractor. Mr. B. Lindskog is the consulting engineer and Mr. L. E. Hudec, the architect.

Shanghai Mercantile Bank

Shanghai Mercantile Bank will have its new quarters at the north-western corner of Honan and Tientsin Roads. The building will have a frontage of 104-ft. on Honan Road and 62-ft. on Tientsin Road. It is to be six stories high with the addition of the basement floor. Natural stone will be used throughout the exterior and the interior will be genuine marble and bronze. Imported steel windows and dramalaut floor will be used in the bank section as well as on all rentable floors. Schindler lifts will be installed and for heating, the Dunham Vacuum Differential system has been decided upon. Messrs. Chao and Chen are the architects.

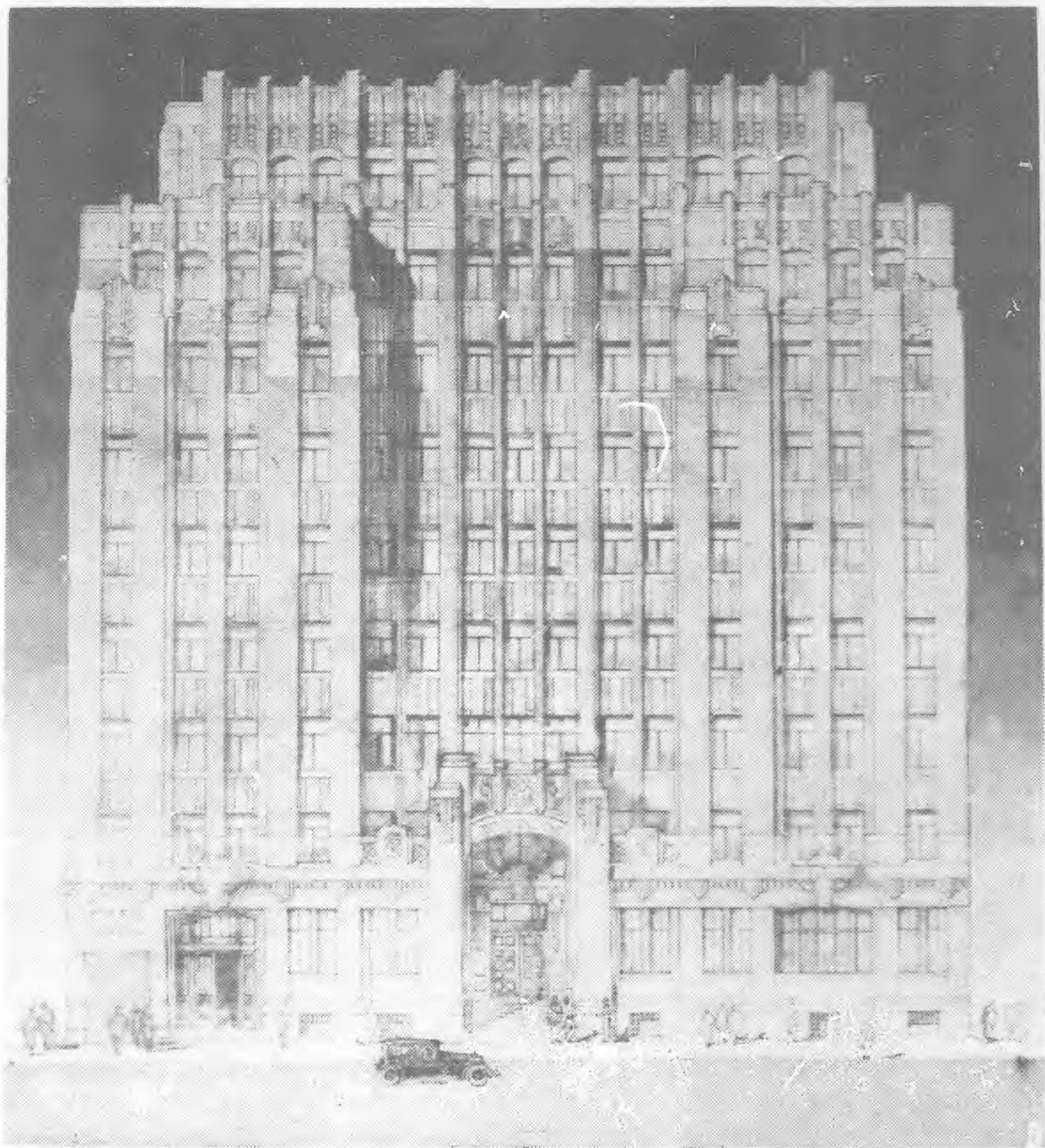
The design is modern in every respect. It possesses the very spirit of modern German and Dutch architecture and yet in its restraint and in the study of its details, the architects show the tastefulness of those with a true classical background.

Separate entrances lead to the bank's quarters and the offices on the upper floors. The office entrance is in the middle of the Honan Road frontage while the corner entrances leads to a wide public space with marble counters on both sides. Unlike other banks the sycee vault here is located on the ground floor instead of in the basement in order to prevent the inconvenience experienced during the frequent typhoons that cause floods in Shanghai streets. A spacious safe deposit vault is provided on the mezzanine floor and it will be equipped with the latest type of boxes and vault door. The rest of the mezzanine floor will be used for the bank's private offices. The architectural treatment of the exterior expresses very frankly the solution of the plan. Indirect lighting will be used to insure comfort to the bank's staff, at the same time to eliminate the presence of hanging fixtures so unsightly in a spacious banking hall. The contractor is Shun Chong and Company. The building will be completed in March, 1933.

Continental Bank Building

On Kiukiang Road, the Wall Street of Shanghai, the Continental Bank will have its new offices. The building occupies an area of 8,000 sq. ft. It will be ten stories. The bank will occupy the first, second and third floors while the rest will be rented as offices. It is expected that these offices will be taken by firms dealing with bonds, gold exchange, and other financial business.

Simplicity in design is a feature of the building. It has a marble hall. The safe deposit equipment was imported from U.S.A. with 4,000 individual boxes. It should be noted that a



Continental Bank Building, Architect, Kwan Chu

number of office rooms of the bank are specially decorated in Chinese architectural style. The cost of the building is one and a quarter million taels.

Bank of China Building

The new building of the Bank of China in Hongkew is one of the most interesting pieces of architectural design. It is an unusual departure from ordinary architecture and it is at once arresting and comment-provoking.

The building looks like a ship. The architect undoubtedly believes in the forging ahead of China's financial situation led by the Bank of China. The design is faithful to the idea of the architect, Mr. H. S. Luke, A.R.I.B.A., Dip., A.A. (London) Honorary Mention. It represents a vessel and in elevation, etc., it has adhered closely to the idea.

The building will be completed in six months. When completed the bank will occupy a portion of the ground floor. The rest of the ground floor will be rented to shops. The first two floors will be let to offices and the rest for flats. The cost of the building is about Tls. 600,000.

National Committee of Y.W.C.A.

The new building of the National Committee of the Young Women's Christian Association of China was completed last spring. The building was designed by Mr. Poy G. Lee strictly on Western

pattern but he used Oriental symbols, carvings, and decorations to bring out a Chinese feeling to the whole. On the fireplace which is found in the penthouse, a standard shape is employed but on the stone lintel above the fireplace is found four carvings symbolic of the four seasons of the Chinese year. The carvings on the stone entrance are also Chinese using the swastika emblem profusely.

The building is located at Yuen Ming Yuen Road overlooking the Whangpoo River at a short distance. It has eight stories, all

of which are used as offices. On the ground floor, one finds the elevator lobby decorated in Chinese style and assembly hall. From the first to the fifth floor inclusive there are twenty-five offices on each to let. On the sixth floor, the headquarters of the Y.W.C.A. is quartered. There is a chapel, a library, a conference room and a number of offices on this floor. The seventh floor the penthouse apartment for hostess work has large living room, dining-room, four bedrooms with two baths, and kitchen.

The contractors are: General—Kaung Yue Kee; Plumbing and heating—General Eng. Co.; Electricity—Andersen, Meyer and Co.; Elevators—Otis Elevator Co.; Steel doors—Hope Co. The cost of the building is Tls. 300,000.

Shanghai Y.M.C.A. Building

The development of numerous activities of the Chinese Young Men's Christian Association demands a large and modern building and the old one on Szechuen Road proved inadequate. The new building on Boulevard de Montigny which was completed in the early part of this year meets the need. The building which is



Bank of China Building, Hongkew District, Architect, H. S. Luke

nine stories high cost Tls. 500,000. The beautiful Chinese roof of the building can be seen at a distance and arrests the attention of all who pass.

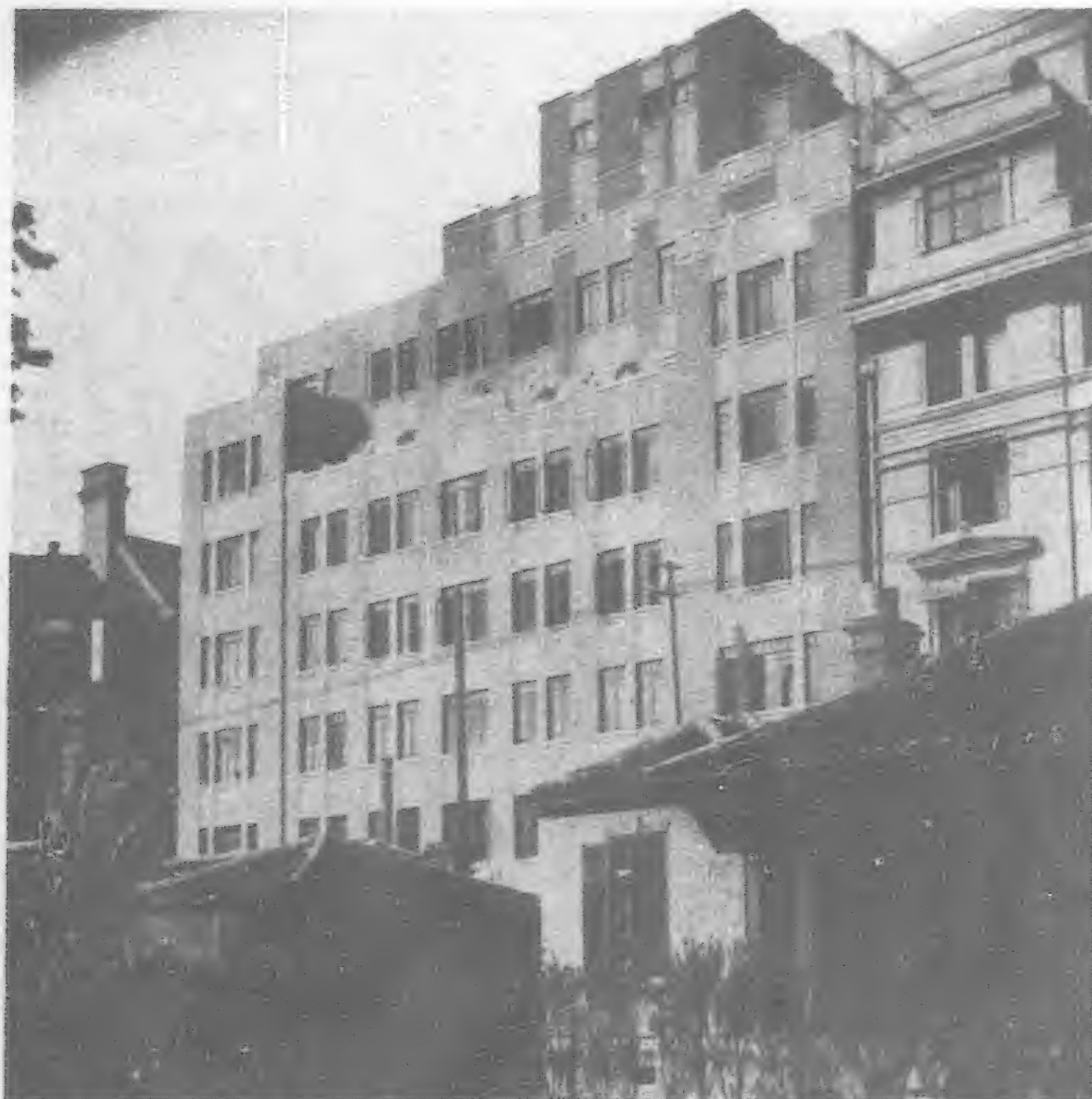
On the ground floor of the building there are situated two banks. The boy's department, shower bath facilities for 300 men, and 100 boys, and a swimming pool also are found on the ground floor. On the first floor, there are lobby, office, library, lounge, billiard room, and auditorium for 500 people. The second floor is occupied by five offices, five classrooms, five club rooms,

and a balcony of auditorium for 200 people. From the third to the seventh floor there are Y. Dormitories with a total of 250 beds. Dining hall and social hall are found on the eighth floor. Penthouse is on the ninth floor.

Kaung Yue Kee is the general contractor. Plumbing and heating was done by the General Engineering Co. and Andersen, Meyer and Co. furnished the electric equipment and Otis Elevator Co. the elevators.

Wayside Godown

The six story reinforced concrete godown in three sections located at corner of Yangtzepoo Road and Baikal Road will be completed in January, 1933. The godown, known as "Wayside Godown" occupies an area of ten mow. The building was designed by Mr. A. Corrit for the Augustinian Procuration, the owner. The cost of the building is one million taels. Civil Engineer and Contractor, A. Corrit, M.I.C.E. Den.: Sanitary and Fire Installations, Gordon and Co., Ltd; Electrical Installations, Larsen and Trock; Steel Windows, Duncan and Co. Two eight ton "Thomas B. Thridge" goods lifts accommodate large trucks to load and unload cargoes on any floor.



New Building for National Committee of Young Women's Christian Association



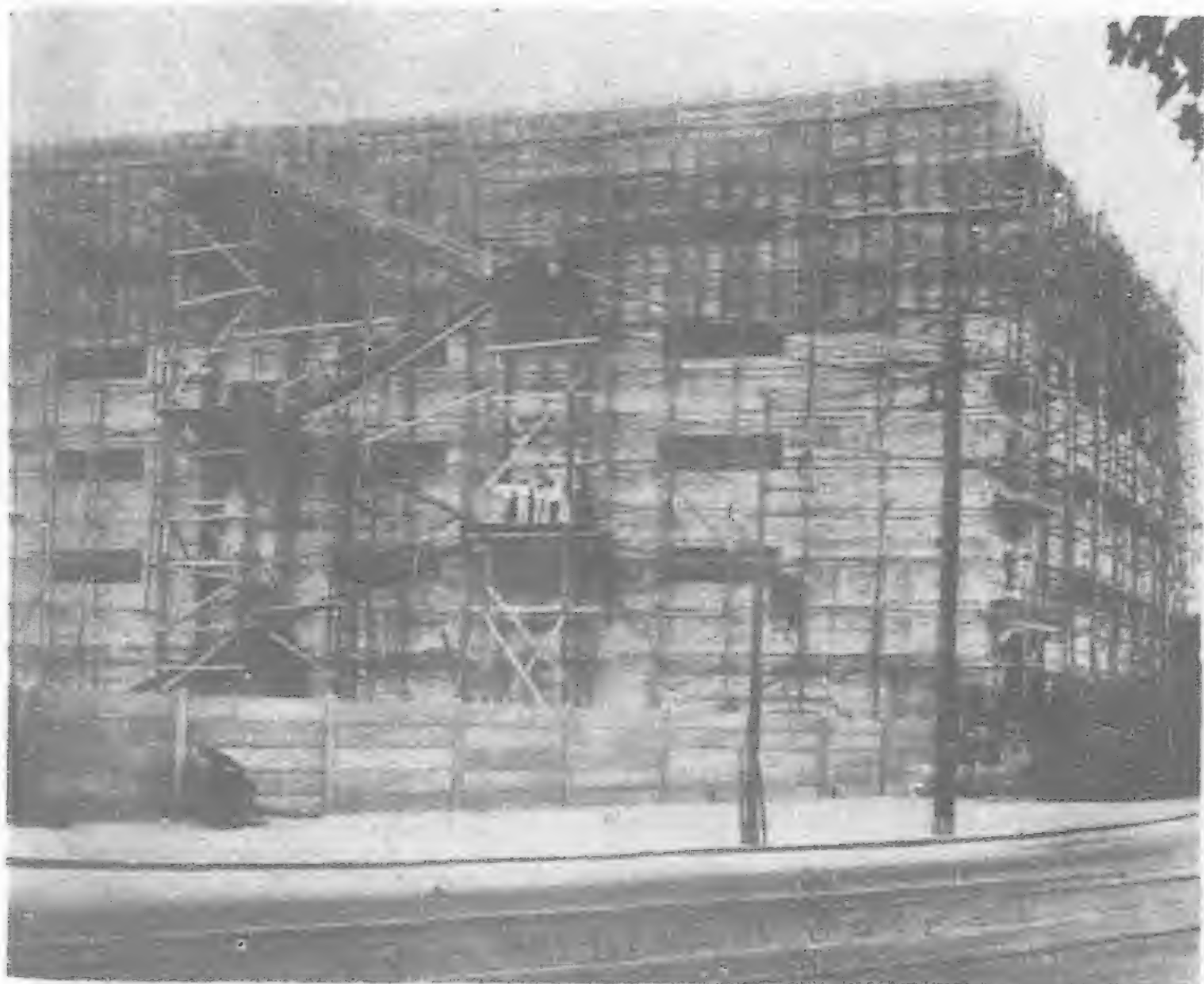
Shanghai Mercantile Bank, Architects, Chao and Chen



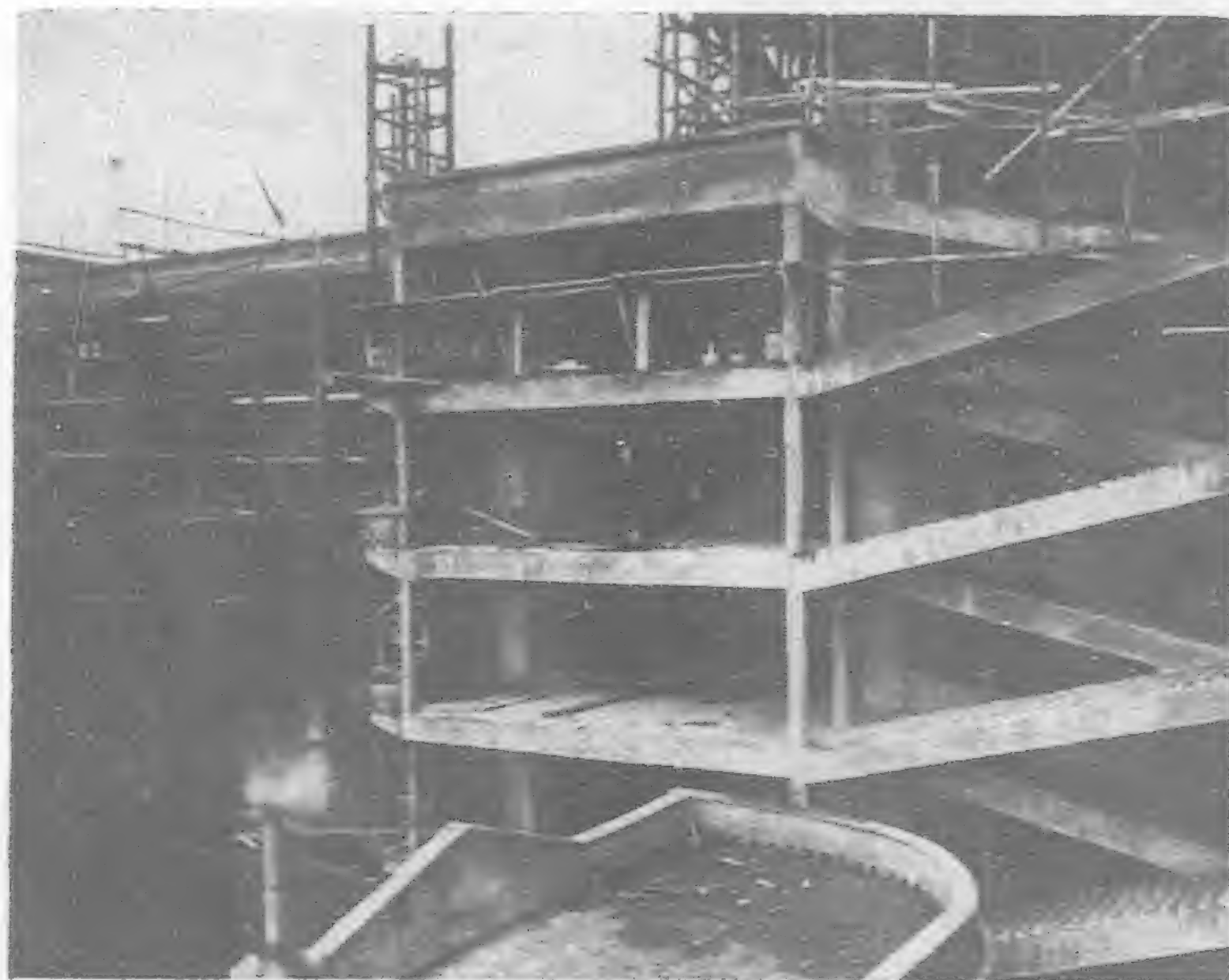
New Chinese Y.M.C.A. Building, Boulevard de Montigny



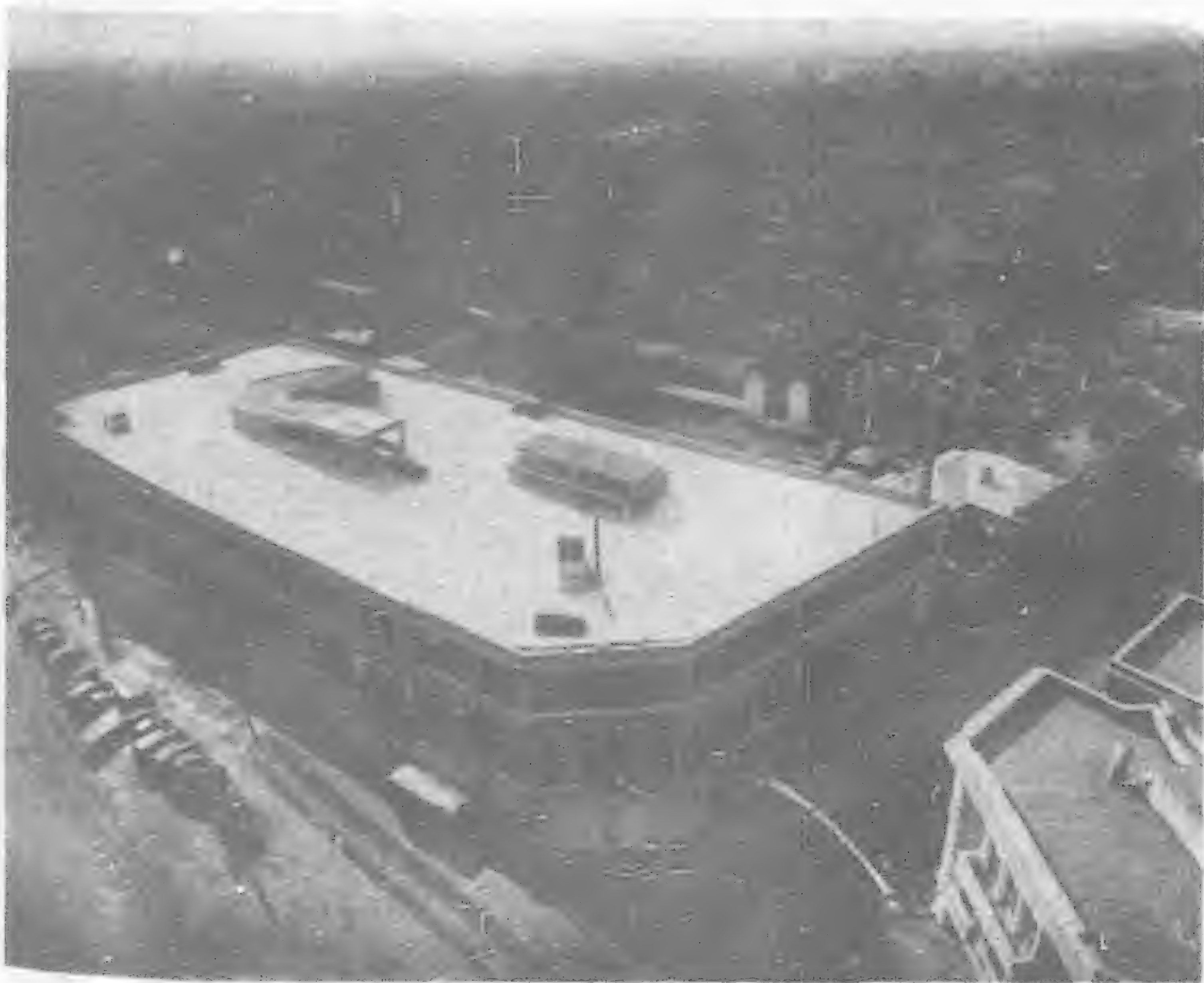
Lower Section New Chinese Y.M.C.A. Building Showing Main Entrance



Godown in Wayside District, Engineer and Contractor, A. Corrit



Imperial Chemical Industries Godown, Engineer and Contractor, A. Corrit



Speedway for Testing Cars on Roof of New Auto-Palace Garage Building



New Home of Auto-Palace Company



New Boys' Dormitory, Shanghai American School nearing completion on Avenue Petain, latest addition to group of School Buildings

Imperial Chemical Industries Godown

The Imperial Chemical Industries Godown situated at Seward Road near Chaoufoong Road was recently completed. The 5-story reinforced concrete godown was designed by A. Corrit for the owner, Imperial Chemical Industries (China) Ltd. The cost of the building was five hundred thousand taels. The special feature of the godown is its modern facilities for loading and unloading goods. One eight ton "Schilinde" goods lift accommodating trucks to all floors and roof is supplied by Jardine Engineering Corporation. Civil Engineer, A. Corrit; General Contractor, Nee Kee Construction Co.; Piling, 100-ft. long composite piles by A. Corrit; Sanitary and Fire Installations, Gordon and Co.; Electrical Installation, Larsen and Trock; Steel Windows, Critall Manufacturing Co.; Glass Bricks, Fagan and Co., Ltd.; Roofing, Acid-resisting Roofing supplied by Fagan and Co.; Surfacing, Taishan Face Bricks and "Gunite" plastering.

Auto Palace

This building situated at the corner of R. Cardinal Mercier

and R. Bourgeat is admirably planned and equipped for the service which this prominent company renders to the Shanghai motoring public. It was designed by Messrs. Palmer and Turner, Architect, Surveyors and Civil Engineers.



New Bakerite Factory, Sinza and Ferry Roads

The first essential in designing a building for automobile service is "manoeuvrability" and with this end in view, the question of pillars for constructing a building of this description received first consideration. All pillars, with a few exceptions, have a uniform spacing of 22-ft., enabling any standard car to turn from one section into another without reversing.

The approach to the first floor and roof was then carefully considered, and it was decided that ramps would be, by far, the most practical, the loss of floor space being more than compensated by the expediency with which cars may be moved from one floor to another. To avoid the danger of accidents on a long straight ramp, it was arranged to make the ramps semi-circular, and of ample width to take two cars, one up and one down.

Though the building has only two stories, foundations have been laid to allow for an additional story being added when business warrants this

additional space. A few figures may possibly be of interest. The building is approximately 300-ft. long and 116-ft. wide, having a road frontage of 364-ft. 115-ft. of which is on Route Cardinal Mercier, and about 250-ft. on Rue Bourgeat.

For the convenience of clients, there are gasoline runways on both frontages, so that whichever direction a client is travelling, he may pull into the runway for the usual supply of gas. These runways undercut the first floor, and form attractive arcades.

The height from the ground floor to the first floor is 20-ft. and from the first floor to the roof 16-ft. These rather exceptional heights were considered necessary to give ample light to the building, and at the same time to carry away the unpleasant fumes from the various vehicles. The result is more than justified.

A description of the layout follows:

On the ground floor, situated at the south-east corner is a large showroom 72-ft. x 27-ft. wide. This showroom may be entered from the street at the corner, or from the various offices which are built around it.

By designing it in the shape seen, immediately inside the building at the back of the offices, there is a semi-circular track, so that a client may enter on Route Cardinal Mercier and leave by Rue Bourgeat, or *vice versa*, without crossing any of the main aisles or parking spaces in the garage.



Majestic Apartments, Bubbling Well Road, Asia Realty Company

A portion of the ground floor is sunk 3-ft. over which steel ramps are run. These steel ramps are adjustable, and may be used to accommodate either the smallest car or the largest truck, by means of quick, simple adjustment. The pits take care of all lubricating jobs in a practical and efficient manner, the latest type of equipment being installed. In the north-west corner of the building is the battery room, with the most modern and latest equipment for charging and repairing batteries of any description. Immediately over the battery room is the electrical workshop, fitted with the most expensive and latest appliances for testing all electrical apparatus as used in modern motor vehicles.

In addition to the equipment as stated in the foregoing, an extremely practical platform-type brake tester is fitted in one of the aisles. This brake tester will enable any client to test his own brakes, and also additional hydraulic ramps, wheel-alignment indicators, etc. In the south-west corner is the control office for the service man in charge of the oiling and greasing, and of the section for minor repairs. At its rear is the store for oils and the mezzanine is devoted to minor tyre repairs.

In the center of the building marked "control office" will be found the workshop staff responsible for the clerical handling of all workshop accounts. Immediately to the right of the Rue Bourgeat entrance is the service manager's office, and a large waiting room adjoins this office. Following this suite of offices is an entrance for vehicles to showroom and to the right of this a Chinese reception and sales room. Immediately inside the entrance from Route Cardinal Mercier is the foreign sales office. Over the whole of these offices in the mezzanine will be the accounts offices.

It is proposed to use the western entrance of Rue Bourgeat as main service entrance. Clients coming into this entrance will immediately turn right into the long aisle where the service reception manager will receive them, and give them every attention. After being attended to by the service reception manager, the cars will then be sent by the firm's drivers to the particular section of the building where the repairs required will be carried out. The cost of the building is Tls. 250,000 while the mechanical equipment cost an additional Tls. 200,000.

Boys' Dormitory for Shanghai American School

The year 1932 sees one more unit added to the plant of the Shanghai American School on Avenue Petain, French Concession, Shanghai, the new Boys' Dormitory which is now nearing completion. According to Mr. J. S. Potter of the Asia Realty Company, Federal Inc., U.S.A., who is assisting the Board of the Shanghai American School in connection with its buildings and grounds, the new unit will be ready for occupancy by January first.

The sketch which is reproduced herewith, gives an idea of the appearance which this building will present when completed. It lies along the north-western boundary of the school grounds, several hundred feet back from Avenue Petain and in line with the dining hall. The main administrative and class room building is that which fronts immediately on Avenue Petain. These buildings, along with the Girls' Dormitory to the east, enclose a section known as the "quadrangle," west of which is the athletic field with its quarter-mile track.



New Nine-Story Apartment Building, Avenue du Roi Albert and Rue Bourgeat by Asia Realty Company

The Boys' Dormitory will provide complete accommodations for some seventy-five or more resident students. In addition there will be two apartments for faculty use on the ground floor, as well as a large social hall, while the upper floors will provide rooms for various boy's activities, as well as baths, etc. The attic is given over for the present to storage, but may at a later date, when needs require, be converted to other use.

The new unit is Colonial in style in keeping with the original school plant, whose red buildings and blue-grey roofs are a distinctive feature of the Avenue Petain district. Another major addition which the School Board has before it, is a new East Wing, scheduled to be added to the Main Building. This Wing will provide primarily a large school auditorium with seating capacity of 500, in the upper portion, and class rooms and other school facilities on the ground floor. Plans have already been prepared for this new Wing, but it has not yet been decided when the work will go ahead.

Another matter which is now receiving attention, is the raising of the western portion of the school grounds to the final level with respect to the streets and the draining and turfing of the lot. This will require the rebuilding of the athletic track, and finally the turfing of the field and the parking of some sections. Tennis courts are being added to the school's athletic equipment.

The school courses range from the earliest kindergarten through the high school, graduates from the Shanghai American School being entitled to enter into standard American Universities without examination.

Bakerite Factory

According to the Asia Realty Company, Federal Inc., U.S.A., architects and builders of the new Bakerite factory at the north-west corner of Sinza and Ferry Roads, this building will be ready for occupancy in January.

With the rapidly increasing business of the Bakerite Company in bread, pastries, confections, ice cream, candies, biscuits, etc., the Company has found it necessary to provide not only for present urgent needs, but also for growth in the future. This splendid new factory building, five stories high, will meet these requirements so far as housing is concerned.

Here on the ground floor will be located the general offices of the Company, while the upper floors have been arranged in accordance with most up-to-date factory procedure for the coursing of supplies through from raw materials to finished product, ready for outward shipment or local delivery.

Here again we see the application of the processes of mass production applied to one more of Shanghai's products, just as is being done in many others of Shanghai's new industries.

The machinery used in the preparation of Bakerite products is of latest and most approved foreign design, most of it originating in the factory of Baker, Perkins and Co., Ltd., of Peterborough, England.

The output of the Bakerite factory will be equal to that produced anywhere in the world as to quality and package, and the sanitary manner of its preparation, "untouched by human hands" so far as content of package is concerned.

Majestic Apartments

The Majestic Apartments of the Asia Realty Company, of which a front view of the South Building is presented herewith, are located on the north side of Bubbling Well Road between Medhurst and Carter Roads.

These buildings provide excellent apartments of from one to five rooms, a total of eighty apartments, fully equipped with kitchen, pantry, bath-room, servants' room, box room, electric refrigerator, electric stove and other modern appointments. The apartments have just been completed, although many of them have already been occupied for a few weeks.

Arco Apartments

The elevation presented in these pages, of the proposed Arco Apartment Building, will give an idea of the new nine-story edifice which is planned for the north-east corner of Avenue du Roi Albert and Rue Bourgeat. Asia Realty Company, architects.

This new building will contain eighteen apartments of two, three and four rooms, each of them fully equipped in most modern manner with central heat, electric refrigerator and electric stove, kitchen, pantry, servants' rooms, store rooms, and in fact all the conveniences that one expects in an up-to-date apartment building.

The style of the building is modernistic throughout, and the interiors are being specially designed to carry out distinctive

motifs in decoration. Certain floors will be distinctly Spanish, others thoroughly English in style, others will be Italian in their appointments. Tenants will find in this popular apartment center flats which will provide every modern comfort of living, and present a distinctive touch of character.

Other Building Work

An addition to the present three big department stores will be built at the corner of Thibet Road and Nanking Road. The new building will occupy nine mow of land. The new department store is promoted by the Sun Company of Hongkong and Canton with a capital of six million taels. The cost of the building will be two million taels. The building will be eight stories. Messrs. Kwan Chu is the architect. The building work has not been started but the land has been recently cleared.

Opposite Shanghai's recreation center, "the Great World," at the corner of Ave. Edward VII and Boulevard de Montigny the Great China Company will build a two million taels building as its headquarters and a number of stores for rent. The building will have eight stories. Actual work of construction has not been started, but the ground has been recently cleared.

The Wing On Company plans to build a new building at Nanking and Kwangse Roads as a hotel extension. The building will be eight stories. Mr. Elliott Hazzard is the architect and the building will cost one million taels.

The much talked of twenty-two story building at Broadway and Soochow Road near Astor House Hotel is still under construction. The foundation work has been completed recently. The building when completed will be used as offices, shops, and apartments. Shanghai Land Investment Company is the owner of this skyscraper which will cost three million taels.

One of the most up-to-date Chinese banks near completion at the corner of Peking and Honan Roads is China State Bank. It is eight stories high and when completed will be used as bank offices and apartments. The building will cost one million taels and Yee Chong Tai is the building contractor.

Near the Navy Y.M.C.A. on Szechuen Road, Fonciere et Immobiliere de Chine is building for the International Savings Society a new office building of nine stories. The building will be used as offices and warehouses. The building will cost one million taels and it is expected to be completed in the early part of the coming year.

On Medhurst Road, Messrs. Davies and Brooke, architects, are building for the owner, Metropolitan Land Company an apartment with the most modern conveniences. It will be eight stories high at a cost of five hundred thousand taels.

The Yangtze Development Company organized by a group of prominent Chinese business men is building an office and apartment building on Peking Road. It will be seven stories high. The cost of the building is not announced.

At Foochow Road and Kiangse Road, the Metropolitan Land Company is building an office and apartment building of fifteen stories. The details of this building have not been revealed yet by the company.

On Shantung Road near Nanking Road, a new hotel for Chinese was recently completed. The building is six stories high with modern accommodations for four hundred people. Mr. S. J. Yang is the architect.

Japanese Shipping Subsidy

A subsidy for shipping amounting to Y. 10,000,000 (£1,000,000 at par), to be spread over three years, is under consideration by the Japanese Government. Its object would be to enable Japan's lesser mercantile marine, which to a great extent is made up of out-of-date and uneconomical ships, to be renewed. The money, according to the scheme put forward by the Ministry of Communications, is to be raised by the issue of bonds. The proposal, if adopted, would result in the granting of a subsidy of £4 per gross ton for 250,000 tons of new shipping on the condition that 500,000 tons of ships over 35 years old were simultaneously scrapped. Thus, before a shipping firm could become eligible for the subsidy of £4 per ton of new tonnage, it would have to scrap double the amount of old tonnage. Determined opposition to the scheme, however, is coming from the Japanese seamen's unions, as it is feared that the passing away of 500,000 tons of the old ships would result in the permanent unemployment of upwards of 4,000 men, only a portion of whom might be temporarily absorbed by the stimulus given to the shipbuilding trade.—*Modern Transport*.



Yokohama Harbor from Camp Hill, Bluff

Yokohama Reclaims More Land for Industrial Sites

By U.S. Vice-Consul HAYWARD G. HILL, Yokohama

AN industrial development of much importance is now nearing completion at Yokohama. This is a reclamation project along the city's water-front. New land built up from the ocean bottom is being dedicated to factory sites for large-scale enterprises, offering such exceptional advantages as alongside wharfage to ocean-going vessels, efficient railroad and highway transportation to the hinterland, and facilities whereby barge traffic may connect with the canal systems of Yokohama and Tokyo.

The reclamation plan was undertaken with a view to encouraging and developing industries in Yokohama. For years Yokohama has been a premier port of Japan, and being geographically so favorably situated for the passage of cargo traffic to and from the Pacific coast or the Orient, it seemed naturally to embody most of the features requisite to a great metropolis and manufacturing center. Since before the earthquake of 1923, forces have been at work toward making the port an industrial city. It was believed that cheap factory sites, offering every industrial facility, would not only bring more trade to Yokohama, but would serve to attract greater wealth, investments, and population to the city, hastening the attainment of its seemingly destined position. Efforts in this direction by private interests, resulting in the reclamation of land on the sea coast approaching the Tsurumi River, had met with great success. It was with full realization of these factors that the municipality of Yokohama undertook the new reclamation project and started construction of what is called the Harbor-Facing Industrial District, now nearing completion.

This district is located in front of Namamugi-machi, Tsurumiku, and Yoriya-machi, Kanagawa-ku, both of Yokohama, and lies within the great breakwater. It covers about 510 acres of land, divided into three areas. Area No. 1 comprises 94 acres, lying just off Yokohama's best industrial section, where a number of important factories have been in operation for some time. Area No. 2 comprises 110 acres, while a third area covers 306 acres. The latter lies across the River Tsurumi, facing the industrial districts of Tsurumi and Kawasaki. Practically the whole new district is encircled by large factories.

Each area of the Harbor-Facing Industrial District, or portion thereof, is most conveniently and advantageously connected, both as regards sea and land transportation. Double tracks are being laid from Tsurumi Depot of the Japanese Imperial Government Railways to a depot in Area No. 3, where freight cars come and go into the industrial district. Every site in the district will have railway siding services.

A 90-foot main highway will run through all the areas and connect with a wide national road running between Tokyo and Yokohama. Other highways ranging from 36 to 60 feet in width are to be constructed.

Canals capable of accommodating 10,000 ton vessels and lighters separate the three areas. Water along the ocean-front embankments has a depth of roughly 12 to 15 feet, and the bottom slopes gradually out to 32-foot depth about 85 feet distant.

Landing places will be constructed at each water-front terminal of highways.

In May, 1932, approximately 80 per cent of the work had been completed. Some highways and cross-roads will not be laid out until sites are actually sold, in order that they may be placed to greatest advantage. Gas, water, telephone and electric power connections have not yet been made, but will be installed to suit the convenience of purchasers of sites.

The schedule for construction of the project calls for completion of all the plans by March, 1934.

The total cost of constructing the Harbor-Facing Industrial District will be about Y.15,000,000. In order to finance the project, a municipal loan bond issue for that amount was drawn up in 1926. The bonds were not all sold at once, but as necessity arose. The Mitsui Trust Co. purchased most of them, and through that concern they have been passed on to private investors. They are to be redeemed in about 20 years, and bear interest at the rate of 5 to 6 per cent.

Work on the reclamation project has been carried on economically and efficiently under the direction of the municipality of Yokohama. Although practically 80 per cent completed, only 70 per cent of the allocated funds has been expended.



Yokohama Harbor from the Yokohama Dockyard



Modern Reservoir for Amoy, China, Waterworks

Reconstruction in South China

One Time "Dirtiest City" Carries Out Remarkable Five-Year Program Making Garden Spot of Amoy

IN spite of the internal disturbances that have characterized China during the past five or 10 years, a considerable amount of construction work is in progress. In a recent tour over South China, the writer noted that a number of cities have been almost completely reconstructed during the past few years.

The outstanding example of this reconstruction is Amoy, on the South China coast. In years past, millions of Chinese from south Fukien Province have migrated abroad and as a consequence there has been a steady flow of remittances back to the ancestral homes. Estimates place these annual remittances from Amoy Chinese at upward of \$30,000,000 (Mexican), or about \$7,200,000. During the past year, because of the economic depression in the

Federated Malay States and in other of the southern countries to which Amoy Chinese have migrated, numbers of wealthy Chinese from these sections have returned to their homeland and have been investing capital in local building and real-estate projects. Admiral Lin, who heads the administration of Amoy City and outlying districts, has taken advantage of this situation and put into effect a program of reconstruction which has meant a greater transformation for the city of Amoy than has characterized any other community in China over the same period of time.

Amoy, up to five or six years ago, bore the distinction of being one of the dirtiest and most insanitary cities in China. Its streets were so narrow that no wheeled vehicles could operate over them,



Amoy's Business Section, Chun San Road



Chun San Garden, South Section, Amoy

not even the wheelbarrow so extensively used in Central and South China. Its buildings were shabby one and two storey structures. To-day the city presents a picture of complete transformation. Well-paved thoroughfares 50 and 60 feet wide, running water, electric lights, a sewerage system, a beautiful spacious public park which would be a credit to any American city, playgrounds, modern schools and three and four storey business buildings are some of the outstanding features of the new Amoy. A sea wall is being constructed along the water front, the reclaimed land being used to finance it. Ten years ago the oncome of evening drew a blanket of darkness over the city; now it is a mass of electric lights, with evidences of enterprise in electric signs.

Modern Construction

Sections of the city are set aside for business purposes, others for residential areas, and still others for industrial plants. The city streets connect with wide, well-paved roads leading into the country. Amoy Island which is nearly 30 miles in perimeter, now has 42 miles of paved roads over which hundreds of motor-

cars are operating. Amoy University, which was endowed some years ago by an Amoy Chinese who accumulated a large fortune in Java, is to-day one of the leading educational institutions of China. Even the Buddhist temples in and about Amoy are undergoing renovations and reconstruction. Three talking motion-picture theaters function in the city, using American films almost exclusively. Amoy has a population upward of 100,000 and is one of the wealthy cities of China. Millions of dollars are being spent on modern construction projects in this city and its environments.

The most interesting phase of the city's reconstruction is the ruthless manner in which streets and roads have been carved through cemeteries. Bones are dug up and put in earthenware jars. It used to be said of China that no railways nor roads could be built because the graves, in evidence everywhere, could not be disturbed. To-day, however, not only in Amoy but elsewhere in China, graves no longer stand in the way of progress.

In a recent communication from Mr. S. N. Chow, Director of the Bureau of Public Works, he says regarding betterments that have been made that "before 1928 there was only one concrete



Scenery Near Proposed Site for Breakwater



The Bund, Portion of First Section



Crane at Work Beginning Second Section of Bund Construction



The Bund, Godown Section Completed



Pek San Road after Asphalting



Highway on Sze Min Island, O-Lin Road



Sze Min South Road Extension



Agricultural Experiment Station

road in Amoy about 2,000 feet in length and since 1928 more than 43 miles of new roads have been built both inside and outside of the city."

More than 8,000 feet of Bund construction has been carried out in this period and another section 2,000 feet in length is now being undertaken by the Netherlands Harbor Works Company and will be completed by August of next year when a solid Bund frontage of more than 10,000 feet will be finished with quays and wharves for vessels.

With regard to public structures and works of various kinds now going forward the following are to be completed this year:

Four public gardens, nine market places, three public cemeteries, 40 public lavatories, three public bathing places, one refuse and sewage plant, one police training establishment, one fire alarm bell tower, butchers' center, agricultural experiment station and various police stations courts and prisons. Two breakwaters are to be finished by next year. In addition to these works other enterprises being carried out include quarters for the telegraph administration, a home for the aged, the Tong-Sean Hospital, the Chun San Hospital and a Leprosy Institution. A proposal for the construction of two public recreation centers is being considered and will probably be carried out next year.

Project for future improvements at Amoy that are taking shape include further lengthening of the Bund so as to divide the city into sections which will include a fisheries portion, business section, industrial section and residential section. It is planned also to link all existing highways on the island to improve traffic facilities. Areas of tracts newly acquired for residential and business purposes are to be enlarged and plans are afoot also to improve irrigation works for lands under cultivation and to cultivate forestry on the island.

Progress in Swatow and Canton

In Swatow, also, it is noticeable that the city has undergone almost complete reconstruction during the past 10 years and now

boasts of wide well-paved streets, motor busses, and other evidences of a modern municipality.

In Canton, a city of probably 1,500,000 inhabitants, marvelous strides in modernization have been made and still continue. Fifteen years ago there was not a street in Canton wide enough for the use of a small motor-car; to-day Canton claims 70 miles of wide well-paved highways, utilized by upward of 1,000 automobiles.

In bygone days superstition prevented the Cantonese from erecting buildings of more than two storeys; to-day there are thousands of three, four and five storey structures along the newer streets. In some cases, where owners lost most of their property in the widening of the streets, four and five storey buildings have been erected on the remaining few feet, so that it is not unusual to see buildings five and six feet deep rising up four and five storeys. Canton has recently completed a civic center, embracing a public stadium, a public library, a monument to Sun Yat-sen, and other public buildings. An American company is constructing a steel bridge across to Honan Island where roads are now under construction, so that the heavily congested Canton may expand to the less populated Honan.

The foreshore along the Canton River is also being improved with stone-and-concrete retaining walls and reclamation work. Another bridge is planned to open up, other outlying areas. Roads radiate into the country so that Kwangtung Province now claims several thousand miles of motor roads whereas 15 years ago not a wheeled vehicle was in use in the entire province.

Hongkong, and the adjoining British leased territory of Kowloon, are experiencing much activity in building construction and in road-extension work. Kowloon is particularly active in building projects. Numerous modern industrial plants are springing up in Hongkong and Kowloon as a result of the favored position which this British colony occupies as an open port and because the silver situation, which encourages domestic industry. This increased activity in modern manufacturing is seen also in Canton and other large Chinese cities.

A GREAT JAPANESE SHIPYARD

The news that the Kawasaki Dockyard Company is so hard hit by the present prolonged depression and its debts so far exceed its capital that some scheme of reconstruction is inevitable is bad news, for it is one of the premier shipyards of Japan as well as one of the oldest.

It was first started in 1878, when only the most enterprising were considering the construction of modern ships in the country, and it was consolidated in 1886. For many years it did not go in for any very large tonnage, but its reputation soon stood high for good workmanship and ingenious design. Then, when the Japanese Navy, having obtained its first ship from Thornycroft and Yarrow in England began to build its own destroyers, the Kawasaki Company took up that type with enthusiasm, and for years concentrated on it and on medium-sized merchantmen of high class. Then, when the war boom arose, and Japanese shipbuilders were inundated with orders for their own and foreign

flags, the yard was expanded to a huge extent, a magnificent plant being built, but unfortunately at the peak of high prices.

It also became intertwined with other Japanese industries, particularly the banks, so that it was involved in the banking crisis of 1927, and for a time appeared likely to have to close down, which would have been a disaster to Kobe, in which it is by far the biggest industry. A timely loan from the Government, together with a partial reconstruction, permitted this crisis to be tided over, and when the subsidized Japanese companies were having to build a lot of new ships to replace those which had reached the age limit, the company netted a number of very useful orders and executed them in a most satisfactory manner. But that little spurt is now over, Japanese warship building is not much more active than British, and something has certainly got to be done in the immediate future.—*Liverpool Journal of Commerce*.

Water Treatment for Modern Centers

ONE of the most important sections of engineering in most countries of the world to-day is towns' water supply, especially as the consumption per head of the population continues to increase. As a result more and more use has to be made of sources of supply liable to partial contamination, and it is imperative therefore that the latest scientific methods of purification, filtration and sterilization be adopted.

For this reason great interest attaches to a new book attractively bound in blue cloth, "Modern Water Treatment Plant 1932," that has just been issued by the Paterson Engineering Co. Windsor House, Kingsway, London W.C.2.

The firm have specialized for over 30 years past on every section of water purification, particularly towns' water supply. Included in their equipment are rapid gravity sand filters with compressed air cleaning, closed pressure sand filters, coagulant treatment plant, and the "Chloronome" apparatus for the continuous and automatic sterilization by means of a measured trace of chlorine gas. Over 2,000,000,000 gallons of water per 24 hours are now being treated by this latter method, including not only towns' supply, but also swimming baths, sewage, sewage effluents, and cooling water for power stations, to prevent organic growths in condenser tubes. In these fields the firm were the first practical pioneers in the use of chlorine, and the method has peculiar advantages for all tropical countries because compressed chlorine gas in cylinders is always a 100 per cent product irrespective of the climatic conditions.

In the new book there is given a most interesting description with a very large number of photographs and drawings of a selection of some of the largest and more important towns' water supply plants that have been carried out by the Paterson Engineering Companies in various countries of the world.

Included are installations for the London Metropolitan Water Board, especially at Kempton Park, Barn Elms, and Walton, the South Staffordshire Waterworks Co., Sheffield Corporation (Rivelin, Ewden Valley and River Don schemes), Bradford Corporation (Challon Heights, Thornton, and Bingley), Newport (Mon), Taf Fechan Water Board (Glamorganshire), Southend Waterworks Co.,



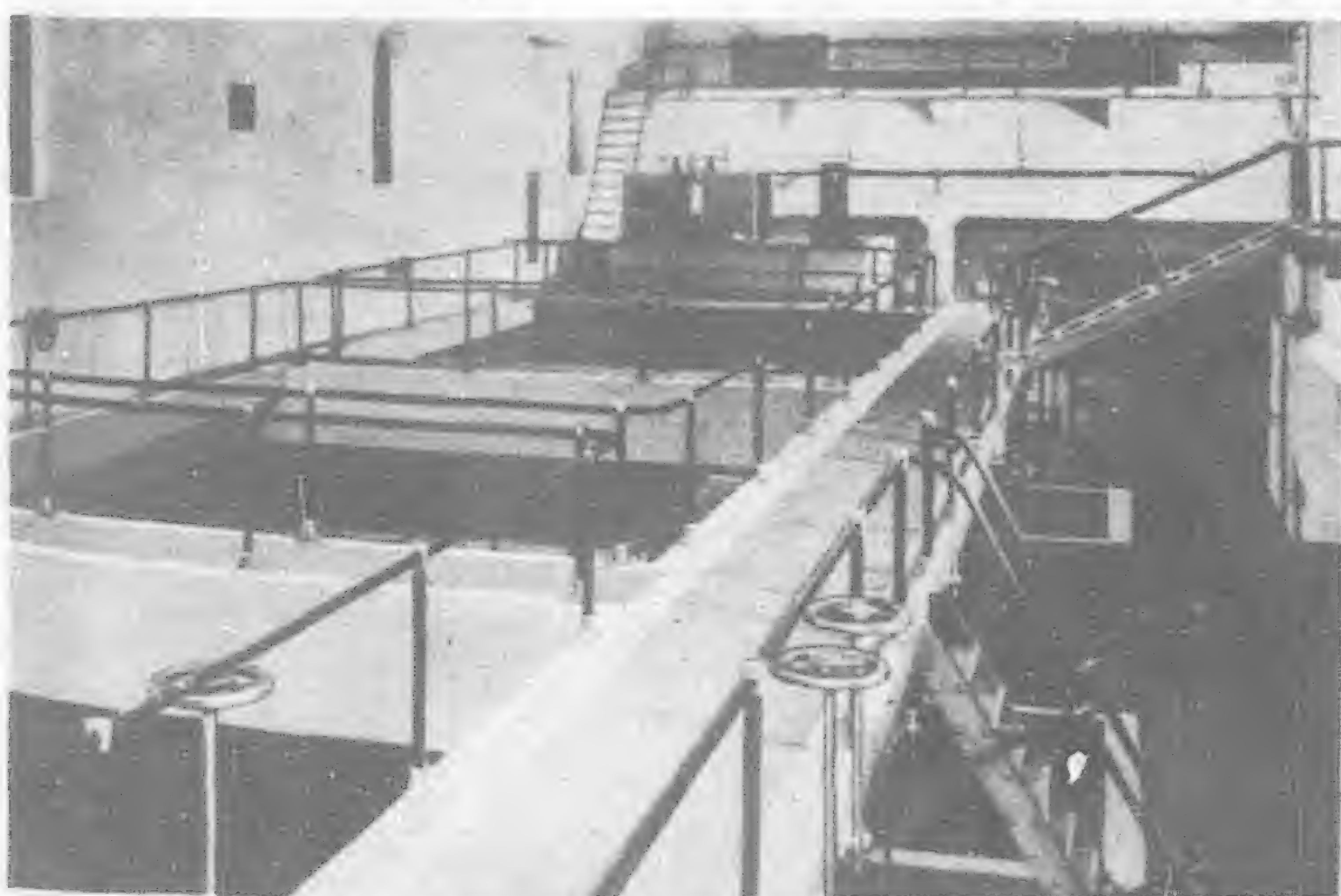
Paterson Rapid Gravity Filtration Plant at Singapore showing Filter House Under Construction

Halifax Corporation, Chelmsford Corporation, City of Londonderry and the Clydebank and District Water Trust.

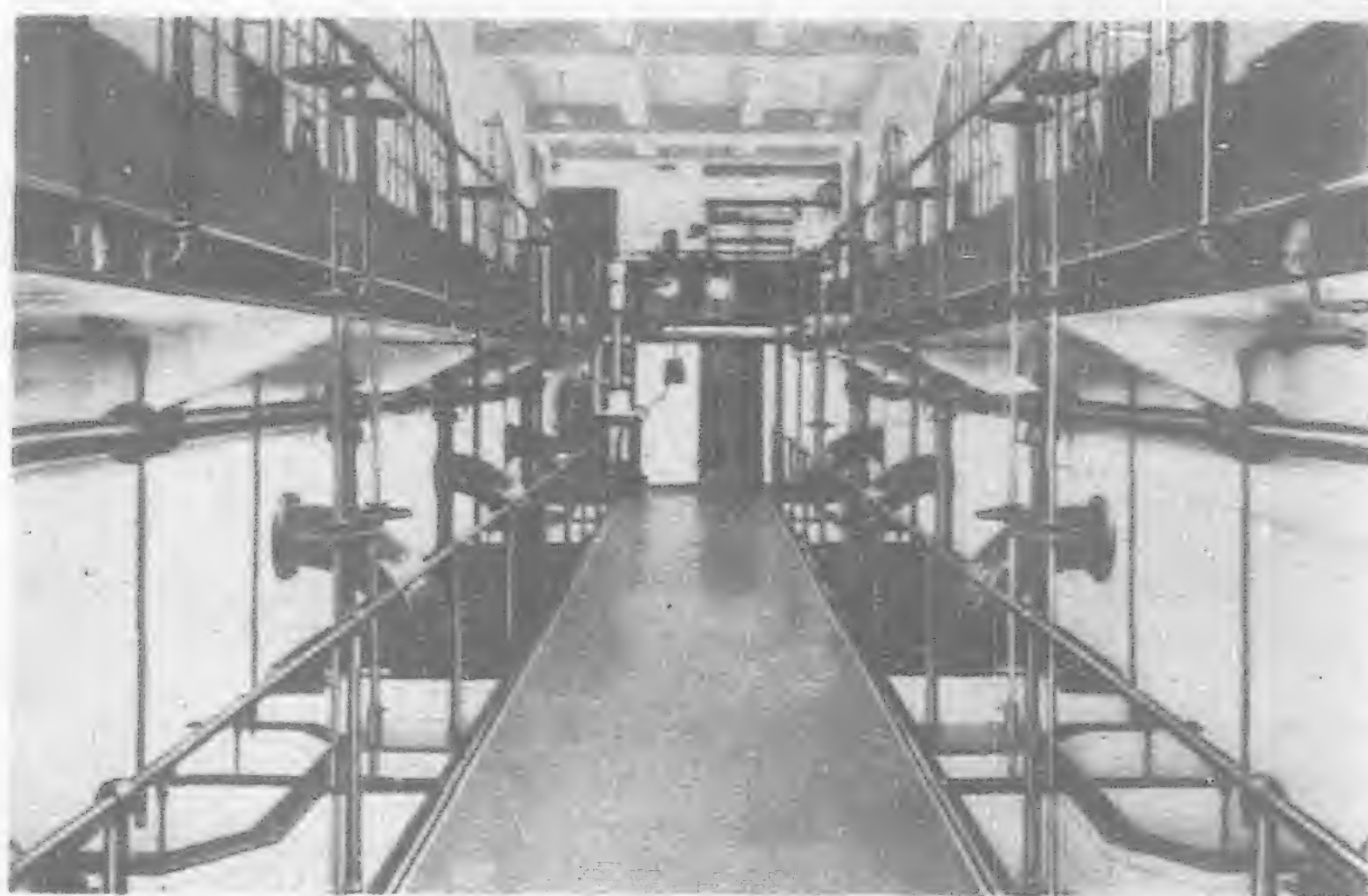
Some important "Paterson" towns' water supply plants in other countries that are described include Rotterdam (Holland), Tallinn (Esthonia), The Rand Water Board (South Africa), Durban, Baghdad, Cairo, Giza, Khartoum and Omdurman.

As regards the Far East reference is made to important plants at Singapore, Canton, Hongkong (Bowen Road, Elliot and Shing Mun), and very many installations in India, including Delhi, Simla, Poona, Lucknow and Jamshedpur. At the new Singapore plant having a capacity of 10,000,000 gallons per day the source of supply is the Pulai River, the scheme being known as the Gunong Pulai, including a "Paterson" rapid gravity filtration plant of the latest design.

It is pointed out that conditions in the Far East are particularly difficult, largely because of the density of the population in many areas, and the great seasonal variation in the bacterial pollution and silt content of the rivers. However, these problems have been surmounted as the result of extensive practical experience and detailed scientific research is shown by the results being obtained.



Paterson Rapid Gravity Filters at Simla



Paterson Rapid Gravity Filtration Plant built for Rand Water Board

CEMENT IN MANCHUKUO

Having succeeded in manufacturing cement out of the waste materials in the Anshan Steel Foundry, the South Manchuria Railway Co. has decided to carry on cement manufacturing work in the next fiscal year in view of the growing demand of cement in Manchuria.

The decision to start the new work has been prompted by the growing activities in building works in various towns in Manchuria. It is reported that the Anshan Work is capable of manufacturing as much as 100,000 tons of cement in a year.

Proposed New Ocean Port for North China*

THE creation of a new ocean port for North China, on the north shore of the Gulf of Pohai, is recommended in the report of the Great Northern Port Commission, which has been studying the matter for two years. This project for a deep-water ocean port, free from ice, originated with the late Dr. Sun Yat-sen, whose plans for the modern development of China as a Republic included three great ocean ports for North China, East China, and South China.

The Nationalist Government organized the National Construction Commission to carry out important public works along the lines of Dr. Sun Yat-sen's plans, and in 1929 this Commission appointed a Board to investigate the Great Northern Port scheme. In 1931, representatives of the Ministry of Railways and the Ministry of Communications were added to the Board, which was then re-organized as the Commission for the Development of the Great Northern Port. The first report has now been presented by Dr. Shu Tien-li, Chairman and Chief Engineer of the Commission. Extensive surveys, soundings, and commercial studies have been made, a meteorological station has been established, and general plans have been prepared for the port and its city.

The site is about midway between Taku, 70 nautical miles and Chingwangtao, 64 miles, in longitude $118^{\circ} 51' E$ and latitude $39^{\circ} 11'$. It has the special advantage of being nearer to deep water than any of the other proposed or existing ports on the Gulf of Pohai. Its distances are 147 nautical miles from Dairen, 126 miles from Hulutao, 96 miles from Tientsin, and 160 miles from Chefoo.

While Tientsin is an important commercial center of North China, it is situated some distance up a river, has only shallow-draught accommodation, owing to the amount of silt which accumulates in spite of dredging, and is frozen up in the winter months. The Taku bar at the mouth of the river, and about six miles off shore, is also a serious obstacle to ocean steamer commerce. The navigation channel inside the bar permits only a

draught of 14-ft., and sometimes only 10-ft., so that large vessels have to anchor outside the bar.

At Chingwangtao there is a pier, but it is inadequate, and that place is neither a manufacturing nor a consuming center. What is needed is an ice-free deep-water first class port, completely equipped with modern facilities. Such a port can be provided

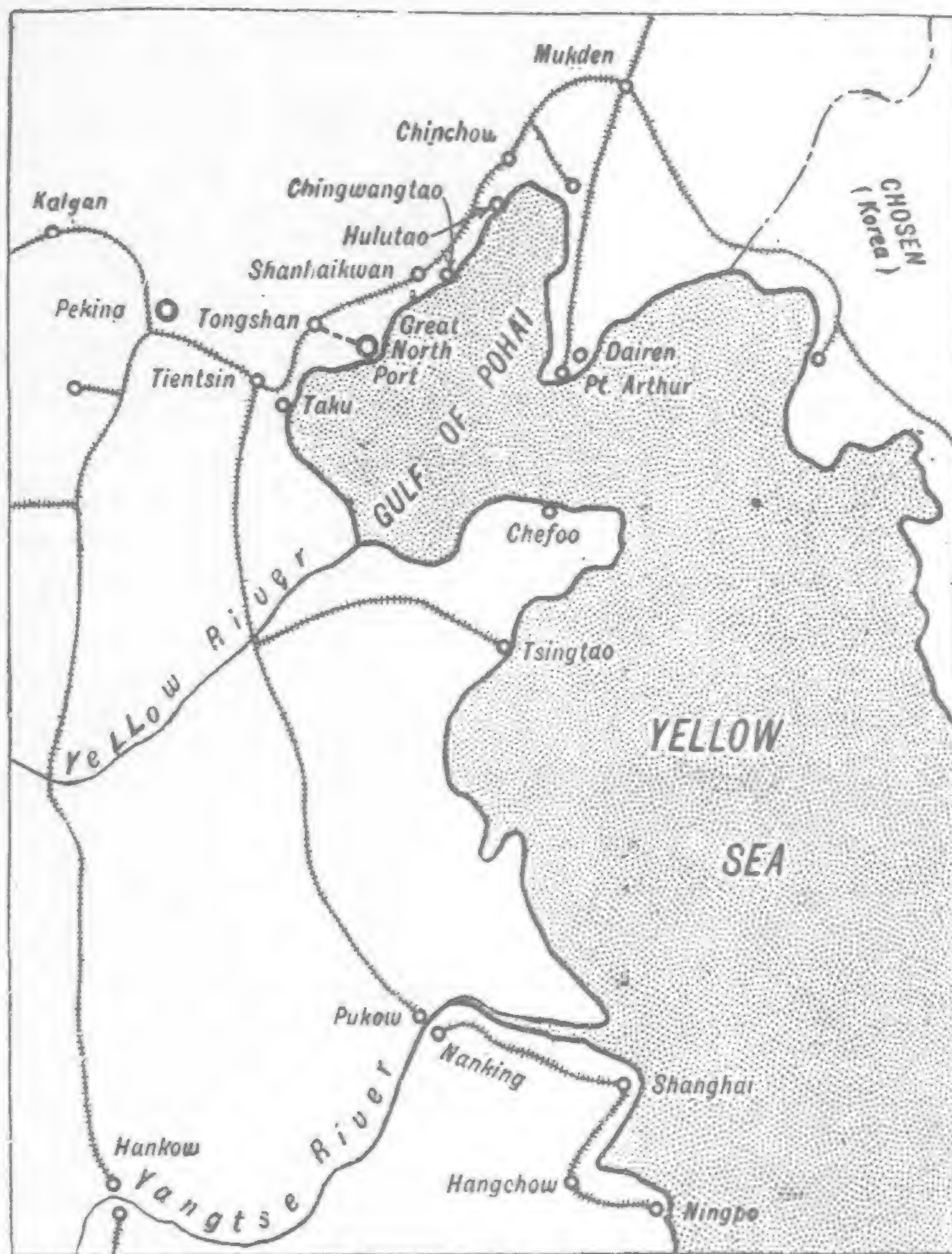
near the mouth of the Lan River, and will be in a strategic position in relation to ocean and coastwise shipping, and to inland transport by rail, road, river, and canal. Further, the site is near the largest salt-producing district in China, and a rich agricultural district, and is only about 40 miles from the well-developed Kailan coal-mining district.

As the harbor is near deep sea water, there is no liability of its being frozen even during severe winters. The tidal range is about 8-ft., or slightly less than at Taku. With the basin only $3\frac{1}{2}$ miles from a sea depth of 35-ft., a short and easily dredged entrance channel will be sufficient to serve it. There would be little or no silting, as the tidal currents would not carry silt from the Lan River to the harbor site. The littoral currents run east to west at rising tide and from west to east with the falling tide.

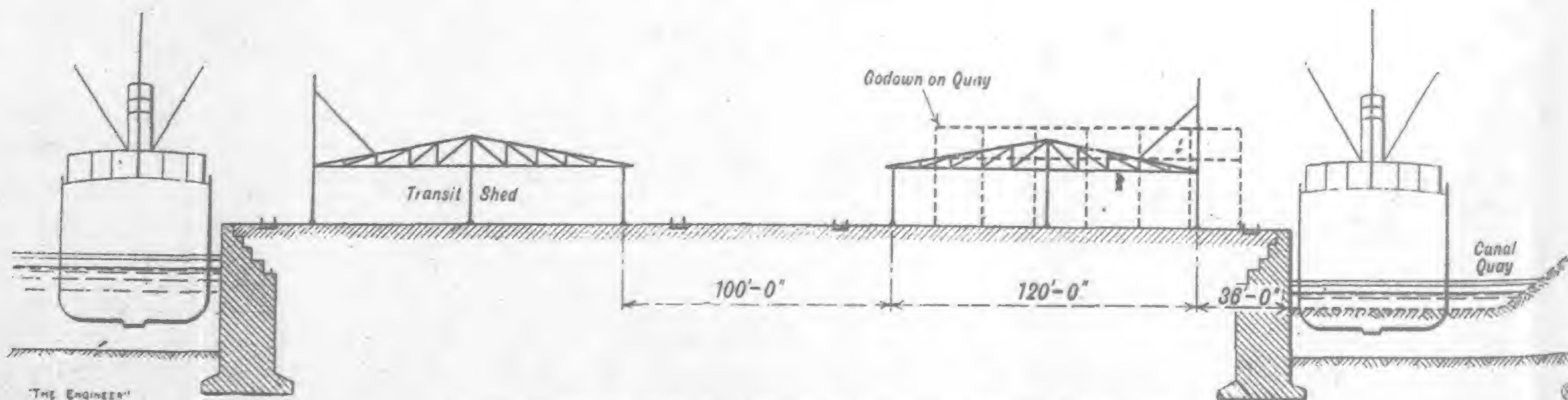
There are few meteorological records available, but those for 1931 showed a range of temperature from 10 deg. to 95 deg. Fah., with an average of 55 deg. to 60 deg. Fah. for the year. Prevailing winds are south-west from February to May and July to September, south-east in June, and north-east from October to January.

Rainfall in 1931 was about 18-in., half of it occurring in July and August. Fogs are few and of

short duration, and snow is moderate in severe winters. Although the sea freezes for about 150-ft. from shore, the ice is thin and may be blown out by the wind; if the fresh water from the Ta Ching River should be diverted further to the south-west, the harbor could be kept open by ice breakers, even during the severest cold.



Position of Proposed Great North Port



Cross Section of Pier and Quay at Proposed Great North Port

*The Engineer.

For internal communications, the first step would be a branch railway from the port to Tangshan on the Peiping and Liaoning Railway. A railway and canal to the Kailan collieries are projected, while there are numerous existing canals in the hinterland, and the Lan River can be improved so as to accommodate light-draught steamers as well as barges. Highway connections would be necessary.

Two principal engineering works would be a pier and a quay, each about 400-ft. wide, composed of solid ground between massive concrete dock walls. There would be 36-ft. of water on both sides of the pier and on one side of the quay, the other side of the latter having a boat canal 100-ft. wide, with 10-ft. of water. On the pier would be two rows of 120-ft. one-storey transit sheds, 100-ft. apart, with railway tracks between them and a track along each water-side of the pier. The quay equipment would be similar, except that a three-storey warehouse or godown would take the place of a transit shed on the canal side, and the only railway line would be a track along the deep-water side of the quay.

Three periods of five years each are proposed for the construction work, with expenditures of approximately £5,000,000 for each period. The first period would cover the execution of the necessary dredging and filling; the construction of the 52 mile railway to Tangshan; a 1,600-ft. length of pier and 3,500-ft. of quay, giving a total of 6,500-ft. of steamer berthing space; the transit sheds and warehouses; and the provision of the necessary pilot boats and tugs; also the laying out of the city and the construction of waterworks and electric light plants. The other periods would cover mainly extensions and enlargements, together with such additional works as dry docks, coaling piers, oil wharves, and municipal structures.

To finance this Government project, it is proposed that port bonds should be issued for £10,000,000 to be expended in ten years. After that period, the Customs revenues and land sales should provide for the final five year period. The report suggests also that in order to distribute the expenditures it might be economical to arrange to provide the necessary funds partly by direct appropriations from the Central Government, partly by internal bonds, and partly by foreign loans. As there are no extensive settlements or works at the proposed site, it is pointed out in Dr. Shu Tien-li's report that the development of the port and the building up of a modern city can be accomplished in an economical way and according to the best planning of engineers and architects.

British Boxer Funds

MR. R. CALDER-MARSHALL, Vice-President of the Board of Trustees for the administration of the Indemnity Funds remitted by the British Government, has given a brief recapitulation of the activities of the Board during the first year of its existence.

Allocations have been approved for the purchase from London funds of £880,000 worth of equipment and material for various railways, of £550,000 for other works, the purchases in the latter case being not yet or only partly made.

From China funds, the chief items are \$876,000 for the Canton-Hankow Railway, £40,000 for the Nanking-Pukow Train Ferry, \$103,000 for the Ministry of Industries, and £13,336 for the Hwai River Conservancy.

The Board of Trustees was duly constituted on March 28, 1931, and at its first meeting the members of the Purchasing Commission were nominated.

To safeguard the funds of the Trust, each proposal made is submitted to the Board and if generally approved is passed to the Technical and Finance Sub-Committees for further more detailed investigation, their reports in detail together with form of proposed contract in which provision is made for security required and for interest and amortisation, being submitted to the Board for discussion and final decision. If then approved by the Board contracts are drawn up by the Board's legal adviser and such contracts are again scrutinised by the Finance Sub-Committee prior to signature. Prior to these regulations coming into force certain purchases were made by the Ministries or organizations concerned and in connection with such purchases contracts either have been signed or are being arranged, due provision being made for interest, repayment for amount expended, and security.

The Board of Trustees are working in strict accord with the terms embodied in the Exchange of Notes, that is to say that the Funds in London are being utilized for the purchase of materials in Great Britain for railways and/or other productive enterprises,

while the funds paid to the Board of Trustees are loaned to similar enterprises, in both cases arrangements being made which should ensure payment of interest and repayment of the capital amount over a period of years.

As the Board of Trustees is entitled to use only the income derived from the investment of the funds for educational purposes, it is obvious that some little time must elapse before the fund available for education is sufficiently large to allocate.

When the Board of Trustees was constituted the total of the accumulated funds in London amounted to £3,442,131, plus interest, while the amount still receivable up to 1945—£7,744,416, making a total of £11,186,547. Of the £7,744,416, £3,872,208 will be paid to the Purchasing Commission in London for the purchase of materials in Great Britain, while £3,872,208 will be paid to the Board of Trustees in China for investment in China as mentioned above.

In accordance with instructions of the Executive Yuan, the Indemnity Funds are to be allocated as under:—

Railways	2/3rd
Huai River Conservancy	40% of 1/3rd
Pearl River Conservancy	20% of 1/3rd
Yellow River Conservancy	13-1/3% of 1/3rd
Ministry of Industries	13-1/3% of 1/3rd
National Construction Commission	13-1/3% of 1/3rd

In every case the funds in London to be used for the purchase of materials for productive enterprises, while the funds in China are to be loaned for purposes of construction, suitable arrangements being made to ensure the payment of interest and repayment of capital.

Up to the present time the undermentioned allocations have been approved:—

RAILWAYS

From London Funds:

Nanking-Pukow Train Ferry	£160,000*
Kiaouchow-Tsinan Railway	350,000*
Tientsin-Pukow Railway	240,000*

Canton-Hankow Railway:

Kwan Shao	£ 30,000
Hunan-Hupeh	110,000
Chuchow-Shaokwan	30,000
	£170,000

From China Funds:

Nanking-Pukow Train Ferry	£ 40,000
Chuchow-Shaokwan	£176,000

Canton-Hankow Railway:

Shaokwan-Lochang	\$700,000
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HWAI RIVER CONSERVANCY

From London Funds	£250,000†
From China Funds	£ 13,336

MINISTRY OF INDUSTRIES

From London Funds	£123,000†
From China Funds	\$103,000

MINISTRY OF COMMUNICATIONS

From London Funds:

Wireless Communication	£ 50,000†
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NATIONAL CONSTRUCTION COMMISSION

From London Funds:

Electrical Equipment	£140,000
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*On repayment funds to be used for Canton-Hankow Railway.

†Purchases either not yet made or only partly made.

AUDIT IN HAND

Agreements between the Board and the Ministries or organizations specified either have been or are being made with regard to the above-mentioned appropriations.

The question of accounting has presented some difficulties as it is necessary to combine the London accounts with those in China and consequently, though the financial year ended on June 30, and though it would be possible to prepare the statement of the China accounts without much delay, a certain time must elapse before accounts are received from England, so that a statement showing the position of the Trust as a whole cannot be prepared for some weeks after the end of the financial year. Messrs. Thomson and Co., of Shanghai, were appointed Accountants and Auditors by the Board of Trustees last year.

Motion Pictures in the Far East

TIENTSIN AND PEIPING

By U.S. Consul GEORGE ATCHESON, Jr., Tientsin, China

THE Tientsin consular district is slightly more than half as large as the United States, but the most of its population of approximately 60,000,000 exists on such a low scale of living that amusements entailing expense are beyond its means. The market for imported commodities other than daily necessities must, therefore, be sought in the cities particularly in this district, in Tientsin and Peiping. The total population of the former is approximately 1,300,000 and of Peiping about 1,000,000. The total foreign population of these two cities, including foreign garrisons, approximates 22,000. The wealth of North China is centered in these cities, and it is here that the classes able to afford amusements are found in appreciable numbers.

Other than a club at Tangshan and another at Chinwangtao, in Hopei Province, both of which are operated for employees of the Kailan Mining Administration and exhibit silent motion pictures once a week, and a silent-picture theater in Taiyuan, Shansi Province, there are no regular motion-picture houses outside of Tientsin and Peiping. At times, however, theaters in the larger of the other cities, such as Shihchiachwang, Paoting, Shunteh, and Taming, exhibit motion pictures as a special attraction.

At the end of 1931 sound-picture theaters in Tientsin numbered eight and silent-picture theaters totaled six. In Peiping the numbers were four and one, respectively.

The seating capacities of the theaters range from 400 to 2,000, and there is wide divergence in the quality and style of their appointments.

There is only one motion picture studio operating in the Tientsin-Peiping district at present. This was established at Peiping during 1931 and is a branch of the United Photoplay Service (Ltd.), a Chinese enterprise with head offices in Hongkong. It is reported to have produced over 20 Chinese sound and silent pictures, a few of which have been exhibited in Tientsin, but their studio at Peiping is still working on its first production.

FILM DISTRIBUTION.—The primary distribution of motion picture films in North China is effected through resident agents and salaried representatives of producing companies, and through traveling agents and salaried representatives of distributing organizations domiciled at Shanghai. American films are distributed principally through resident salaried representatives and the European through traveling agents and representatives. There is but one salaried representative in North China for Chinese films, their chief distribution being effected through traveling agents and representatives.

Tientsin is subordinate as a distributing center to Shanghai, where the head offices of distributing organizations for the whole of China are situated. Primary distribution to the local theaters takes place either on a percentage or a fixed-price basis—usually the former—while secondary distribution is accomplished through sub-leasing films, controlled by lessors, on a fixed-price basis.

The percentage basis upon which films are let ranges from 35 to 65 per cent of the gross receipts (the average being 40 per cent), while fixed prices for foreign programs may vary from \$44 to \$440 per week for "first-run" houses, practically half of these amounts for "second-run" theaters, and about 30 per cent thereof for "third-run" houses. Chinese silent pictures are let for from 40 to 50 per cent of the gross receipts, except to theaters not "first-run," which obtain releases on a fixed-price basis per program, ranging from \$11 to \$44 a week.

CENSORSHIP.—There are five separate municipal entities at Tientsin: The area under Chinese jurisdiction, composed of the first, second, third, and fourth special areas and the native city, and those under foreign control, namely, the British, French, Italian, and Japanese concessions. Inasmuch as there is no central board of motion picture censors, films exhibited at Tientsin may be censored by five different boards.

Under the regulations now operative in the Chinese areas of Tientsin, a fee of \$2.20 is charged for each 500 meters of film censored, while in Peiping and Tientsin both, certain scenes or films may be deleted or banned.

No censorship fees are charged in the foreign concessions, but exhibition of certain scenes is prohibited.

SINGAPORE

By Assistant U.S. Trade Commissioner D. DEGOLIA,
Singapore, Straits Settlement

A 29 per cent decline in importations of new films and continued inroads on the American films by British pictures in Singapore occurred during the first quarter of 1932, as compared with the corresponding period in 1931. Importations of new films during the respective quarters totaled 902,069 and 1,260,923 linear feet, of which the United States supplied 678,175 feet (1,143,382 feet in the 1931 period), and the United Kingdom 117,985 feet (21,181 feet).

The number of performances of British films has been raised artificially by longer runs and return bookings in first-run houses—both seldom justified by box-office appeal of the features but necessitated by the relative scarcity and inexpensiveness of the British films. The better class American features continue to pay best. There has been no decline in the number of houses available, so the above noted falling off in footage imported is taken up by return bookings, longer engagements, and use of reimported film.

Attendance has not improved materially, and practically all houses are satisfied to cover expenses without appreciable profits.

CANTON

By U.S. Consul-General J. W. BALLANTINE, Canton

Canton is the only city in the entire consular district where motion pictures are exhibited with any degree of regularity, with the exception of the Portuguese colony of Macao, which has two motion-picture houses which give two performances each evening and three matinees a week. Small theaters are located in Kongmoon, Wuchow, and Kiungchow (the principal city of Hainan Island, off the southern coast of Kwangtung) and other towns in the interior occasionally exhibit old Chinese feature pictures.

There are two types of motion picture theaters in Canton. Six of these theaters show only foreign films and have a daily seating capacity of 20,500, as compared with a total daily capacity of 25,200 for theaters showing Chinese films or old foreign features which have been converted for Chinese consumption. Three of the latter types are run by Chinese department stores in connection with roof gardens. Admission to the roof garden includes other forms of entertainment, such as Chinese dramatic performances and vaudeville shows, and amounts to between \$0.04 and \$0.06 in United States currency. In general, the admission fee in theaters showing Chinese and old foreign films is much lower than in those showing first-run foreign films, and the patronage comes mainly from the lower middle class Chinese who understand no English and have a very low average income. In these theaters interpreters are used to explain the pictures to the audience, as many patrons of theaters of this kind are quite illiterate. In one theater the interpreter has been given a microphone-loudspeaker apparatus to assist him, phonograph records being used frequently to supply music, practically all of which is Chinese. Other Chinese theaters handling native productions are considering the installation of similar equipment.

Of the 18 motion picture houses in Canton, the six showing foreign films have all been wired for sound pictures. They all have two projectors and show on the average of about 13,000 feet of film at each performance, i.e., about 13 reels consisting of one nine to 10 reel feature, a news reel, and two to three reels of comedies, cartoons or specialty numbers.

ATTENDANCE—EQUIPMENT USED.—Attendance varies, according to the popularity of the picture being shown, from 20 per cent of capacity for an unpopular picture to 90 per cent of capacity for a popular one. The talking pictures have undoubtedly increased the attendance at moving-picture shows, and several of the theaters which show Chinese films exclusively are gradually changing their equipment to display the new Chinese talking features and second-run foreign talking pictures. Explanations in Chinese characters

(Continued on page 535)

The Pocket Motor Gunboat "Kotaka" of Imperial Japanese Navy

By Y. TAJI, M.I.N.A., M.I.Mar.E.

A NUMBER of river gunboats of the Imperial Japanese Navy are in service for the protection of Japanese interests in the lower and upper Yangtze districts in China. In some cases, however, those of usual sizes and types have been too large for certain duties imposed and inconvenient for operation, so that the necessity of building a number of shallow draught gunboats of a much smaller displacement with suitable armaments has been strongly urged by the naval force stationed in these districts, which resulted in the construction of the "pocket" river motor gunboat *Kotaka* displacing some 60 tons of water at a draught of 0.640 meter.

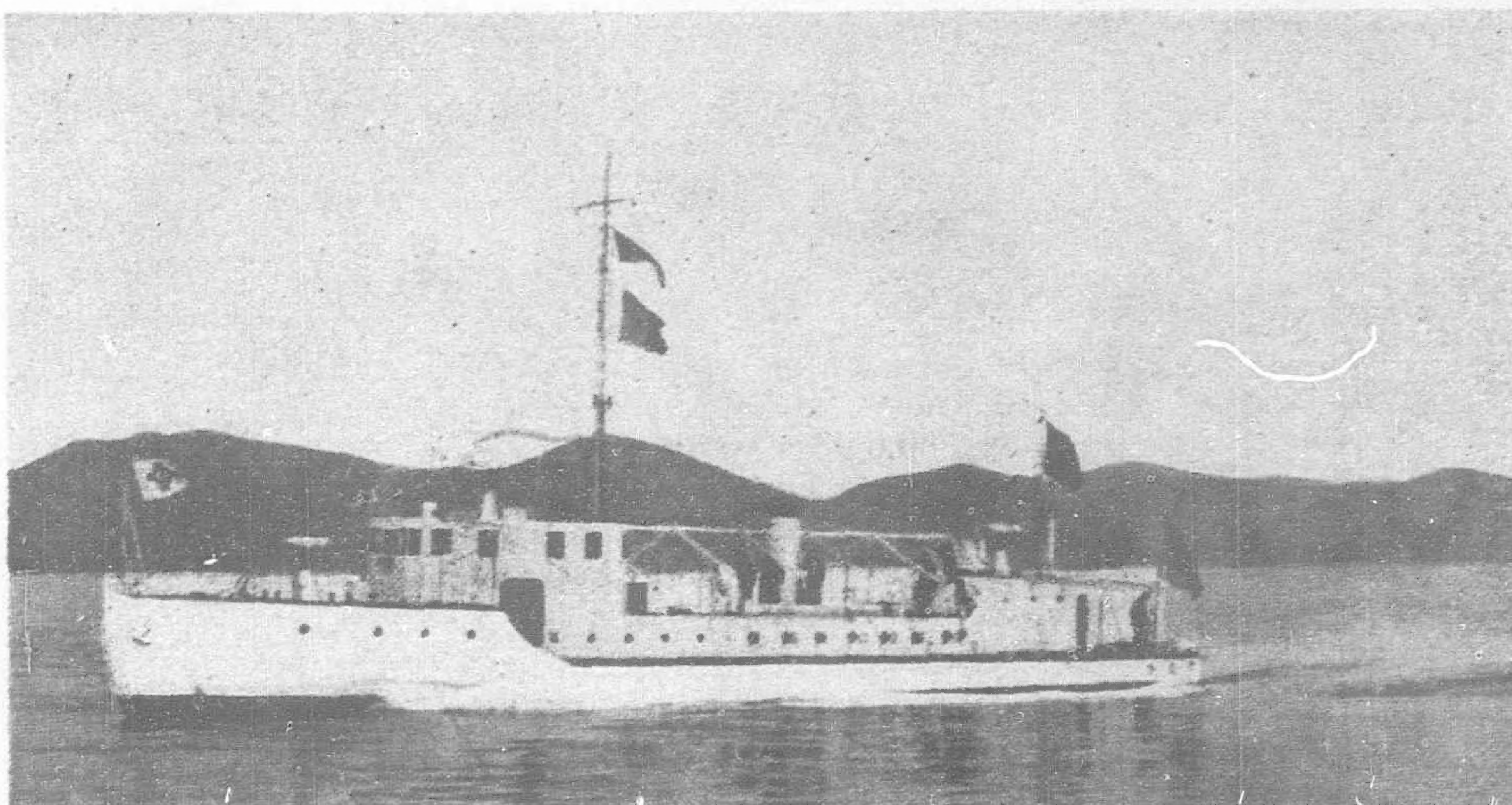
The Japanese Admiralty, after deciding to build such a boat, carefully considered whether it would be most convenient to build her in China, or to complete all the necessary work for the assembling, in Japan, and to assemble them in China as used to be done with these class of vessels, or to build her completely in Japan and then to transport to China (Shanghai) by a suitable freight ship. It was finally concluded that the first and second schemes may provoke various troubles, so it is best to adopt the third method.

There is not the slightest trouble on the Japanese side in adopting the third scheme, as sufficient facilities are available in Japan for practically any heavy lift as well as for the embarkation on board a ship, but in Shanghai the New Engineering and Shipping Works only have a floating crane with a maximum capacity of 56 tons which leaves practically no allowance for the assumed weight of the boat, 55 tons. It having been found, however, that it is possible to use this crane, the third scheme was finally adopted.

Under such precautions, the vessel was ordered from the Mitsui Tama Works in Japan and has been completed to the entire satisfaction of both the Admiralty's overseers and the builders.

PRINCIPAL PARTICULARS AND GENERAL CHARACTERISTICS.

Length between perpendiculars	30.000 meters.
Length over all	30.500 "
Breadth moulded	4.900 "
Depth moulded	1.400 "



The "Kotaka" on Trial Run

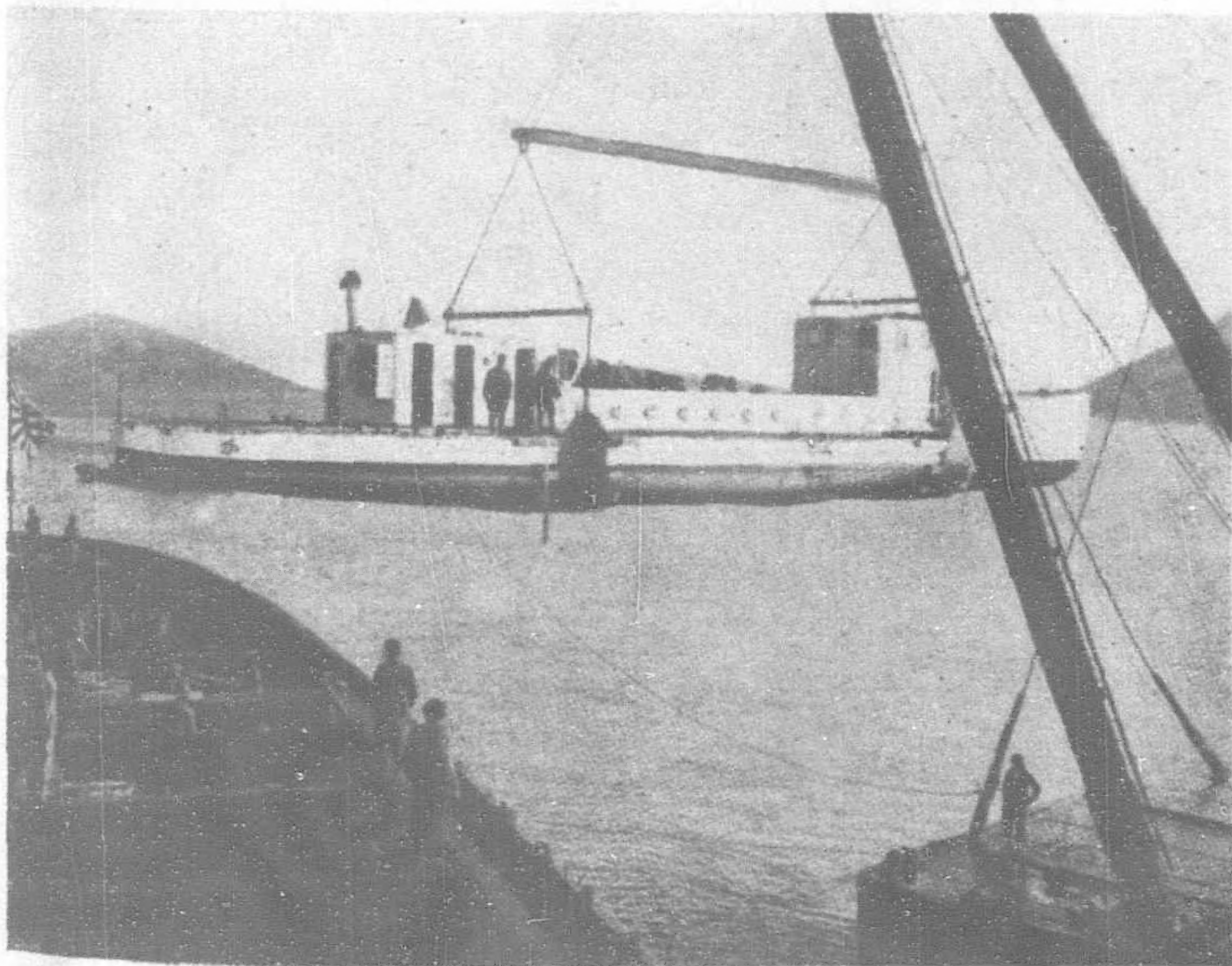
Mean draught	0.640 meters
Displacement	60.668 kilo-tons.
Speed	15.5 knots,
Shaft horse-power	540.
Engines:—	Two sets of 270 b.h.p. Diesel engines.	
Armaments:—	3—77 mm. Lewis guns.	
	10—rifles.	
	7—revolvers.	

LEGEND OF WEIGHT (normal condition):—

Hull	24.306 kilo-tons.
Fittings	7.525 "
Equipments	4.536 "
Armaments	3.014 "
Main engines	17.786 "
Auxiliary machinery	0.476 "
Spares and miscellaneous	0.206 "
Oil and water	0.700 "
Fuel oil	2.000 "
Unknown weight	0.119 "
Total	60.668 kilo-tons.

General Arrangement and Hull Construction

The vessel has a continuous upper deck extending from stern to the aft end of forecastle deck with wide openings for machinery and crew spaces, a long forecastle deck, a casing deck extending over two-thirds the length of the ship amidships covering the machinery



Showing the "Kotaka" being lifted aboard Naval Transport "Seito"

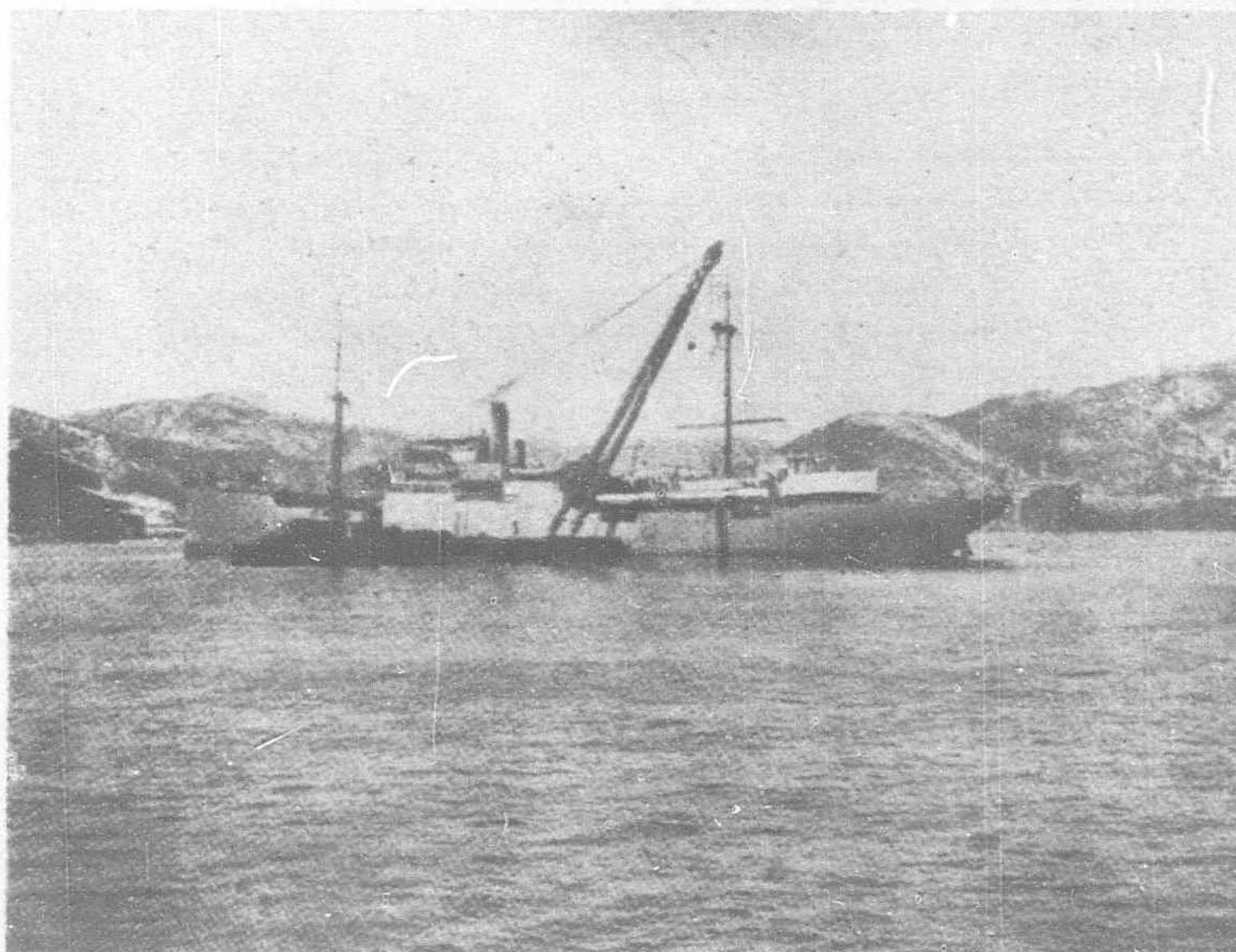
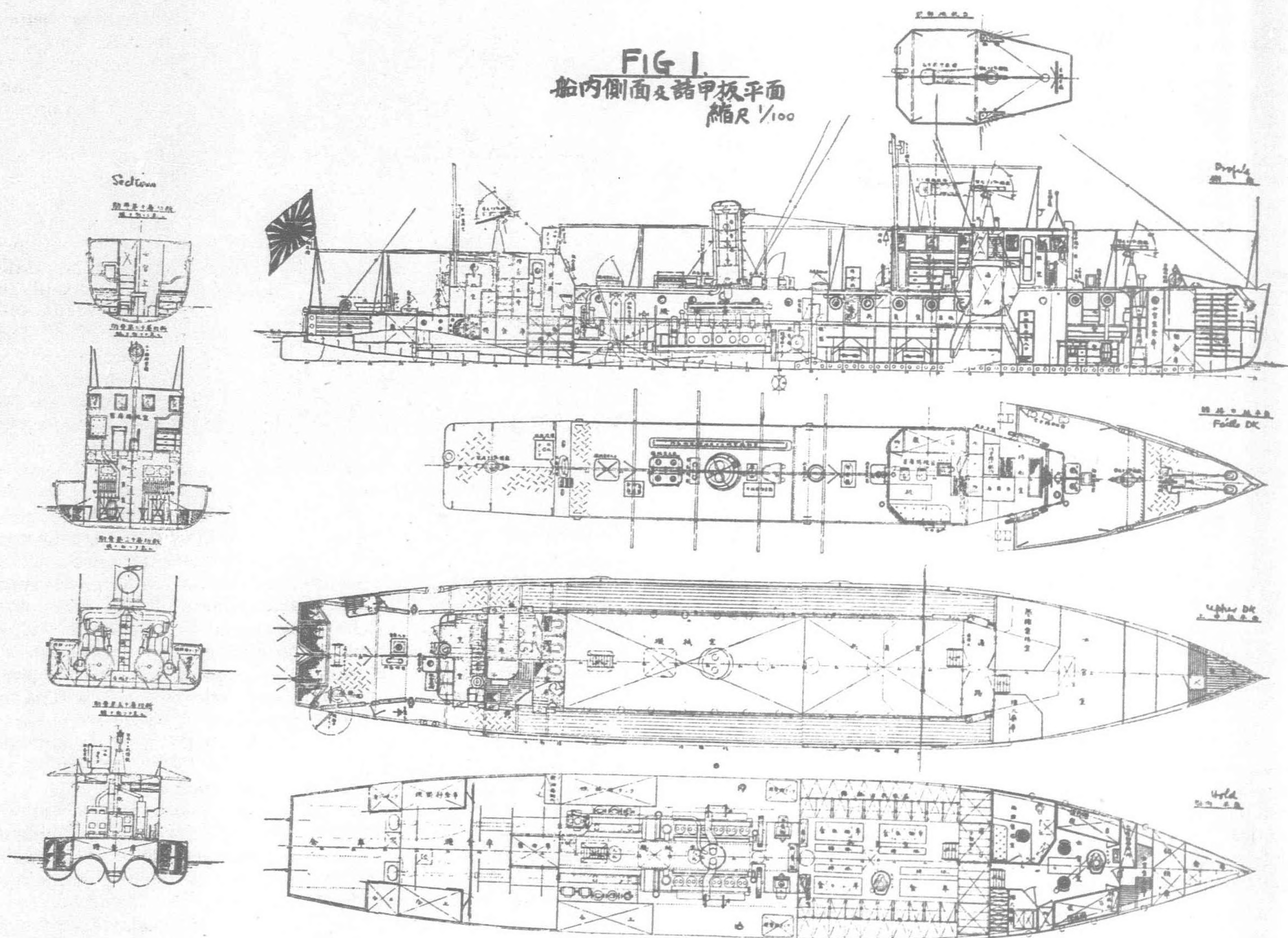


FIG. 1.
船内側面及諸甲板平面
縮尺 1/100



Profile and Deck Plans

and crew spaces and connected to the forecasing deck at the same height as forward and aft machine-gun platforms, whilst the hull is subdivided by six watertight transverse bulkheads into seven watertight compartments, comprising forward stores and a chain locker, an officers' compartment with a wireless telegraphy room and a small magazine, a large crew space, a machinery room, large provision stores and a boatswain's store.

There are a high foremast, a shortmast and a dummy funnel installed with a silencer, and the vessel appears just like a smart cruising boat or a "rum-chaser" of the U.S. Government.

On the forecasing deck are a hand driven windlass, a 77 mm. Lewis gun, aerial trunks, etc., and between the forecasing and the casing deck, a steering room and a commanding officer's room are situated, whilst on the casing deck amidships a dummy funnel, lockers, companions, skylights, engine room ventilators, etc., are arranged. The aftmost part of the casing deck is raised high where a 77 mm. Lewis gun, a river water tank, etc., are installed. Over the steering house and commanding officer's room is the forward machine-gun platform, where a 77 mm. Lewis gun, a one-meter range finder, a 30 cm. search-light, navigation lamps, etc., are provided.

On the upper deck forward are entrances to the officers' compartment and a large opening for the crew space, both occupying spaces up to the bottom of the ship, whilst a large engine room casing is situated amidships, and abaft this casing are officers' and men's lavatories, a bath-room, a galley, a ready-use provision room, a wash place, etc. At the stern are twin rectangular semi-balanced rudders with Rapson slides and chains operated by a steering wheel in the wheel house.

All living quarters are comfortably accommodated and well protected from heat and cold to suit the special service, the officers' compartment in the hold being allotted for two junior officers with every necessary convenience and annexed with a wireless

telegraphy and telephony room, whilst ample space is given to the crew space with tables, benches, lockers, chests, large box beds, a stove, etc. and is well ventilated.

The engine room is situated near amidships where are installed two sets of 270 b.h.p. main Diesel engines, two electric generators driven by gasoline engines, a switch-board, other auxiliary machinery, two lubricating oil tanks, and two fuel oil tanks, etc.

The hull is constructed as light as possible, yet with ample structural strength for shallow draught, and special precautions have been taken for the construction in vicinity of the engine room in order to prevent vibration and to furnish sufficient longitudinal strength. Also, the upper deck is well connected to the forecasing deck in order to avoid any abrupt change in the longitudinal strength, having besides the substantial casing deck and side walls to reinforce it. In view of navigating in shallow water and rapid streams with dangerous rocks, accidental damages being often liable to occur, the vessel is well subdivided into several watertight compartments and is provided with propeller tunnels and twin rudders of unusual size, whilst the machine-gun platforms are arranged as high as possible for the convenience of counter-attacking an enemy's firing from banks, and particularly against the rifle fire of cowardly bandits on tops of high cliffs along the Yangtze valleys. Special precautions are also taken for protection from the terrible heat in these districts during summer time.

It is worthy of note that the more ignorant Chinese judge the fighting strength of a warship by her dignified appearance and the speed by the number of funnels and the amount of waves produced in propulsion, so that a dummy funnel or preferably more funnels are necessary for a motor war craft. Further, in order to protect them from sudden attacks by rifles or machine-guns from a high cliff as mentioned above, a bullet proof roof for the navigation bridge is also indispensable. The abnormal heat due to the continental climate in these districts during summer

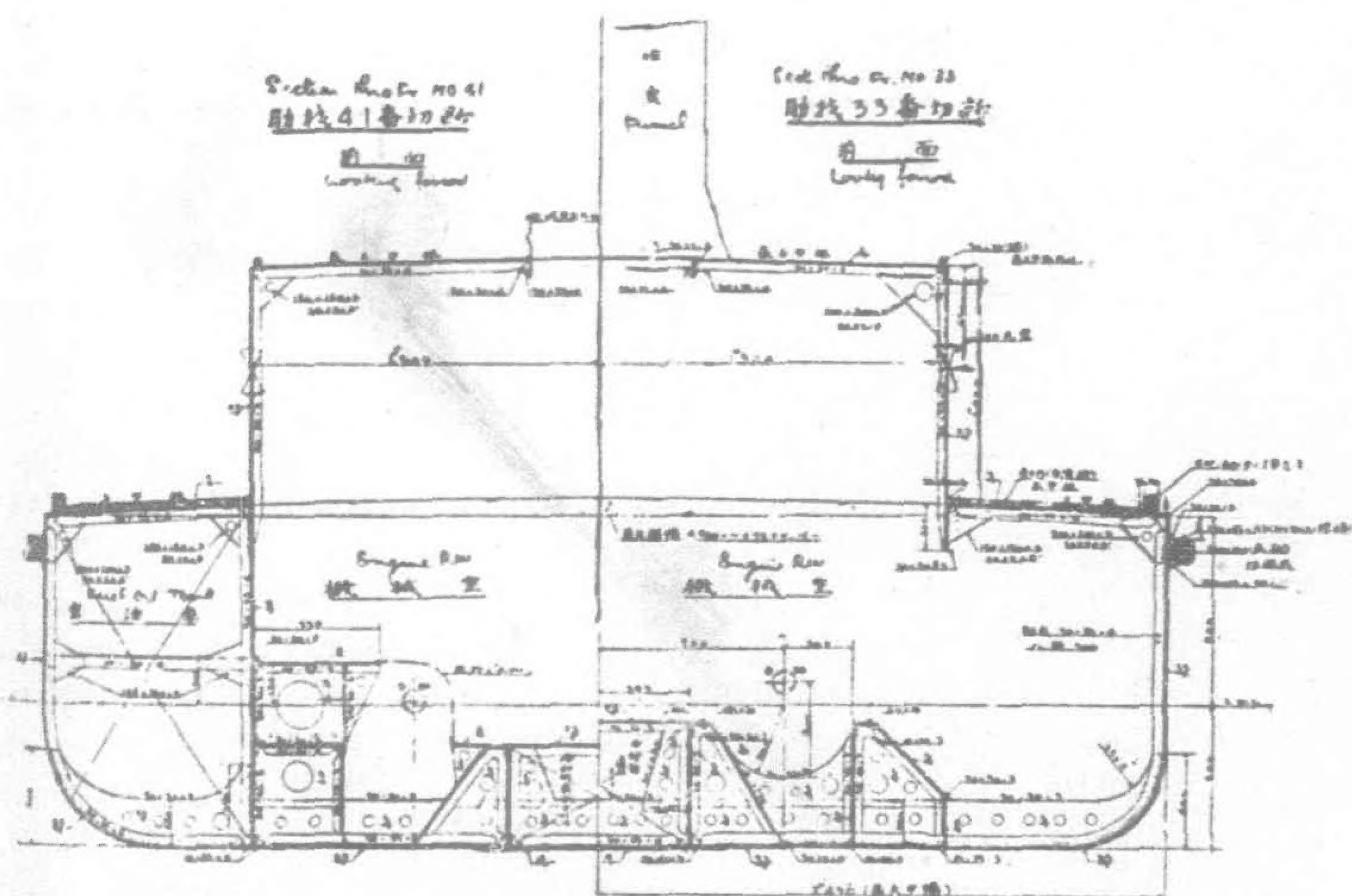
time necessitates special arrangement for the protection from direct sunshine and heat in day time and for sleeping facilities on deck at night, together with the prevention of plague due to unhealthy and filthy local conditions, and for that evaporators and distillers of unusual sizes are required for the production of fresh water, as the river water is hopelessly dirty and colored dark yellow with every harmful impurity and infectious bacteria. The writer has had the experience of having designed a gunboat for service in those districts and confirms the fact that such precautions are imperative for the design of vessels on the Yangtze River and its tributaries.

Constructional details as well as the general arrangement are shown in the accompanying plates.

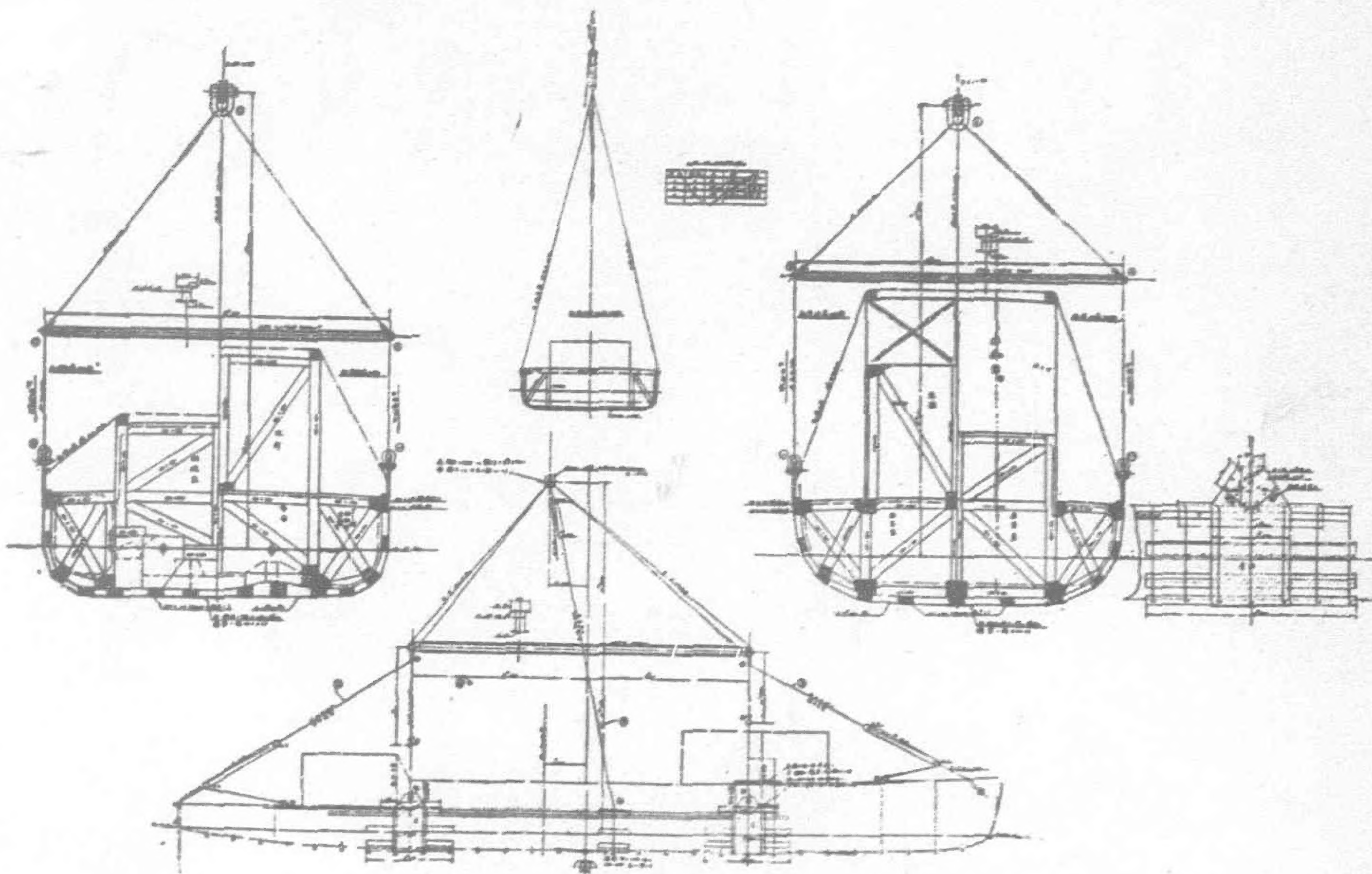
Lifting and Lowering Arrangement

Should the capacity of the crane be sufficient, a heavy lift of some 50 or 60 tons is a very easy matter, but in the case of the *Kotaka* the specially designed lifting and lowering devices together with the most careful operations were necessary in view of various existing limitations, as the vessel was completed in Japan and had to be transported over sea to China and then be safely launched there from a naval transport ship.

FIG 2. A
中央横断 縮尺 1/30



Mid-Ship Section

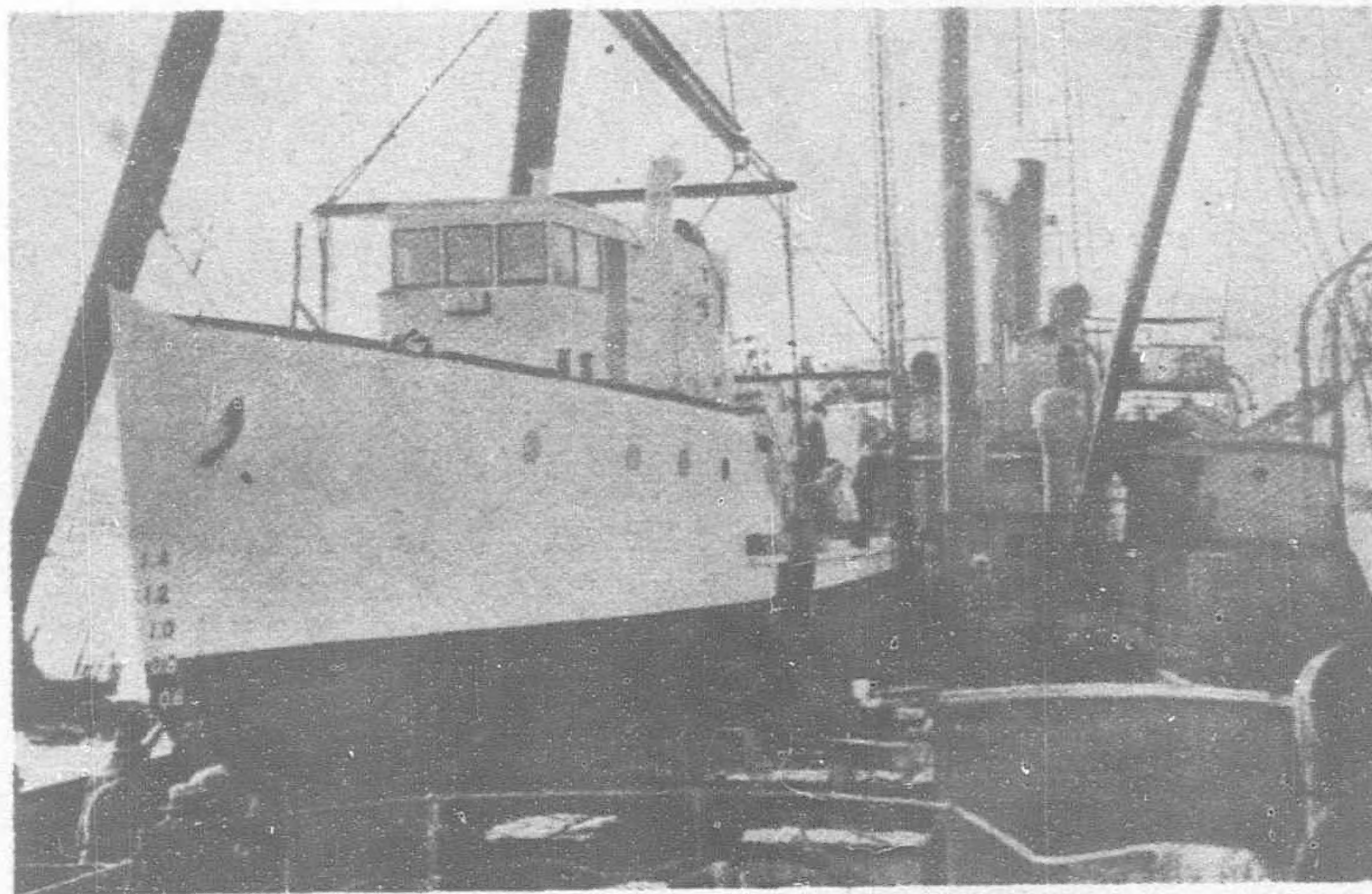


Arrangement of Lifting Equipment

vessel should be safely movable from the deck of the naval transport *Seito*. There is a record of lifting a fairly large ship for transportation overseas from Europe, but the present circumstances having been fundamentally different from that case, it compelled the Japanese Admiralty and the builders to design and construct a special mechanism after very careful stress and deflection calculations for both the lifting devices and hull structures. The actual design is shown in the plan attached. The final actual lifting weight was 53.500 tons, in which 7.250 tons are for the lifting devices, whilst the weight detached from the ship was 10.719 tons.

With such careful arrangements the boat was successfully embarked on the deck of the naval transport by the builders' floating crane and launched on the Whangpoo River at Shanghai by the New Engineering and Shipping Works' floating crane from the transport without the slightest damage being incurred.

This arrangement may be considered as an outstanding example of the transportation of a delicate ship over sea with limited facilities.



The "Kotaka" Embarked on Deck of the Transport "Seito"

Motion Pictures in the Far East

(Continued from page 532)

are projected on a small white screen placed on the wall beside the stage.

The costs of motion-picture projectors and sound equipment in Canton amount to the Hongkong prices plus customs duties, river freight, insurance and handling cost between Hongkong and Canton. Most of the theaters in Canton use American projectors, although there are about seven Pathé projectors of French make in

use here. Some of the small theaters purchase old and rebuilt models to cut down initial cost of installation. All of the houses exhibiting foreign films use American equipment. Projectors are stocked by firms handling cinematographic equipment in Hongkong, and prices are controlled by Hongkong distributors, local houses making purchases from importers in that port.—*Commerce Reports*.

Engineering Notes

INDUSTRIAL

MINISTRY BUILDING.—The corner-stone for the new building of the Ministry of Foreign Affairs at Nanking will be laid at the end of this year. Plans for the structure have been completed. The cost of construction is estimated at \$400,000, which will be appropriated from the British Boxer Indemnity Refund in accordance with arrangements already made.—*Kuo Min.*

MACAO COMMUNICATIONS.—The new Director of Posts at Macao has three jobs in hand. First, he is to complete the extension of the telephone lines, making up the total to two thousand, to satisfy the demands for private houses. The second work is to link Macao with Taipa and Coloane by telephone. The laying of cables will be in charge of the P.W.D., and a new dredger from Germany will work at top speed. The third job is the installation of a broadcasting station. The Director is also thinking of linking Macao with Hongkong and Canton by radio-telephone.

TENDERS WANTED.—The Municipality of Singapore has called for tenders, to be presented in Singapore or London by October 20, for the supply of two 1,000 gallons per minute pumps of the vertical spindle centrifugal type, direct driven by electric motors complete with starters and air exhausters for priming. Firms desirous of offering goods of United Kingdom manufacture can obtain the further details of this call for tenders, together with particulars of the Special Register service of information, upon application to the Department of Overseas Trade, 35 Old Queen Street, London, S.W.1. Reference number G.X. 11874 should be quoted.

BRITISH EQUIPMENT.—During the past few years Japanese purchases of British electrical machinery have shown a sharp decline. The total value of Japan's imports of this class in 1927 was £318,000. Last year it had fallen to £25,000: in fact, the imports of some classes, e.g., rotary convertors, ceased altogether. At the same time, it is clear that the trade has not been entirely lost. This is demonstrated by an article on the new Kokura power station. The Metropolitan-Vickers Co. is to be congratulated upon securing the order for the two 25,000 kw. high-speed turbo-alternators for this station, the four new boilers are of Babcock and Wilcox manufacture, and the auxiliaries also include a number of items of British production.

RAILWAYS

JAPAN RAILWAY ELECTRIFICATION.—Tokyo Bluff Rapid Transit Railway Co. is to start work on the construction of the first section of proposed railway between Shibuya and Koyenji at a cost of Y.1,000,000.

CHINESE RAILWAY WORK.—The eastern extension of the Lung-Hai Railway from Haichow to Hsukow, on the Kiangsu coast, will be completed by next spring, according to a responsible official of the railway. Side by side with the building of the railway, the work of completing the wharves and godowns as well as the development of the Hsukow harbor itself is being carried on. The cost of the harbor works under construction is estimated at \$1,300,000, it is learnt.

A corps of engineers are now conducting surveys on the proposed route of the Shihchiachwang-Taku Railway following the conclusion of arrangements between the Ministry of Railways and French financial interests for a loan of 350 million francs. It is reported here that Mr. Tseng Chung-ming, Vice-Minister of Railways, will be appointed Director of the Engineering Bureau of the new Railway.—*Kuo Min.*

BUYS SLEEPERS.—A shipment of railway material, consisting of 200,000 wooden sleepers, has arrived in Nanking for delivery to the Tientsin-Pukow Railway Administration. The consignment was purchased from America by the Ministry of Railways at a cost of over \$400,000.—*Kuo Min.*

BUYING SLEEPERS.—For the reconditioning of the road-bed of the Peiping-Hankow line, the Ministry of Railways has placed an order for 300,000 pieces of sleepers, which will be used to replace those which have deteriorated. The contract price is stated to be \$600,000.—*Kuo Min.*

TRAMS FOR NANKING.—Plans for a network of trolley car lines for the main thoroughfares of Nanking are under consideration. The National Reconstruction Commission's preparations are far advanced and the project practically decided upon. Transportation in the capital at present depends chiefly on rickshas, motor-cars and omnibus service. A system of rail-less trams will meet the growing requirements of the population. It is understood that the contract may be awarded to a German company.

CHENGTING-TAIYUAN RAILWAY.—In compliance with orders from the Ministry of Railways, deputies of the Chengting-Taiyuan Railway, accompanied by French engineers, for a survey of the proposed route of the Shihchiachwang-Taku Railway across Hopei province. It is understood that for the present the route will be charted from Shihchiachwang as far as Siaofan, a town midway between the two terminals, 100 miles east of Shihchiachwang. Survey operations for the Tatung-Tungkwan Railway, another projected line in the North-west, will commence as soon as survey work on the Shihchiachwang-Taku Line is completed. It is reported that funds for the construction of these two railways has been secured by a loan made by the Ministry of Railways with a Franco-Belgian banking group.—*Kuo Min.*

SHIPPING

NEW SINGAPORE PIER.—The Governor of Singapore, in rejecting the Straits Settlements Association's opposition to the name of Clifford Pier being given to the new landing stage at Singapore, explains that there will continue to be landing facilities at the point long known as Johnston's Pier, although the precise nature of the structure has not yet been determined. His Excellency can see no justification for removing Mr. Johnston's name from the site to which it has so long been attached, renaming that site and transferring Mr. Johnston's name to a new pier on a new site, even though the distance between the two sites is small.

ANNAM PORT IMPROVEMENTS.—It is proposed to modernize the ports of Tourane, Vinh-Benthuy, Quinhon and Nathrang. Tourane is the most important port in Annam. It is proposed to construct a large and deep anchorage on the right bank of the river Cam-Lé, so that big ships will no longer have to anchor in the bay. The port will be connected with the town of Tourane and the railway by a bridge over the river. The estimated cost of the work is 5,600,000 piastres. Only coasting vessels use the port of Vinh-Benthuy. Here periodic dredging will be carried out at a cost of 100,000 piastres a year. It is proposed, ultimately, to construct a canal, at a cost of about 10,000,000 piastres. Owing to the expectation of increased traffic at Quinhon, berthing space is to be provided in the lagoon, and the access and anchorage improved. It is also proposed to construct an outer port. To attract ships to French Indo-China, it is intended to make great improvements to the port of Nathrang, including the construction of a dam between one of the islands in the bay and the mainland.

JAPANESE MERGER.—Following the recent amalgamation of three of the biggest paper companies in Japan, negotiations are under way for a merger of the two biggest steamship companies, namely, the Nippon Yusen Kaisha and the Osaka Shosen Kaisha, so as to unify Japan's sea transportation. Keen interest is attached to the outcome of the negotiations.

NEW JAPANESE GUNBOATS.—The Naval Ministry has placed an order with the Kiangnan Docks for two additional gunboats, which are to be duplicates of the newly launched Haining and Kiangning. The new boats will be named the *Fusing* and the *Suining*. Each will be 128 feet long, 20 feet wide, with a draught of 10 feet and a speed of 10 knots per hour. The total cost is estimated at \$500,000. It is learnt that these are the first two of ten similar vessels to be constructed for the Ministry.

MINING

COAL IN CHINA.—The unworked coal deposits in the province of Honan, China, are estimated to amount to 1,914,000,000 tons, according to the *Chinese Economic Bulletin*. The coalfields are situated in the North-western mountains in the province named, and transport is a difficulty in exploitation. All the coal is said to be anthracitic, except for some 280,000,000 tons located in four areas. Coal has been reported from two other areas, but the extent of the deposits is unknown.—*The Engineer.*

FIND MINERALS.—Mineral deposits have been discovered on Sunchia Shan (mountain), near the northern Kiangsu coast, by workmen of the Lung-Hai Railway while engaged in boring a railway tunnel through the mountain for the eastern extension of the line. The discovery was reported by Mr. Yu Shih-pin, Director of the General Affairs Department of the Railway, recently after returning from an inspection. Although the exact composition of the ore has not yet been ascertained, it is believed to be a rather fine grade of lead deposits. Specimens are being sent to Nanking for chemical analysis.—*Kuo Min.*

AVIATION

PLANES FOR CHINA.—Realizing the inadequacy of China's air force, Honan Province has raised \$300,000 through private contributions and has purchased three fighting 'planes for the Chinese Government.

The machines have already arrived in Shanghai, and the Aviation Bureau is sending experts to bring them to Honan first, in order that the Honan public may view their donated machines, after which the 'planes will fly to Nanking to join the regular Air Force.

NEW JAPANESE SERVICE.—A regular triangular flight for passengers and freight, connecting Chichihar, Dairen and Heijo will be commenced soon, according to Chief Kodama of the Technical Section of the Aviation Bureau and Chief Ando of the Aviation Affairs Section of the Japan Air Transport Company. According to them, two Super-Universal passenger planes will be used for the time being but several more planes will be operated beginning early next spring. Chief Mugita of the Dairen Office of the company will also take charge of the works of the Mukden Office as its head.

Mr. Okabe of the company is to be appointed as the chief of the Harbin Office. As for the head of the Shingishu Office, the choice has yet to be decided. At present the Japan Air Transport Company is offering its planes to the Army by contract for sending military supplies and for communication purpose.